



UNIVERSITÀ DEGLI STUDI
DI SALERNO



UNIVERSIDAD CATÓLICA
de Colombia

**A VIRTUAL NOTEBOOK DESIGN FOR REFLECTIVE CONSTRUCTION OF
LIFE PROJECT TO LOOK FOR ENTREPRENEURSHIP IDEAS**

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ABSTRACT

The present work has as objective the creation of a proposal for the design of a technological tool in the generation of the life project for the community of the “Universidad Católica de Colombia” institution, by using Design Thinking techniques; to promote and encourage students to be people who about us?, their abilities, their motivation and the path they are going to follow to fulfill their life project; where they are allowed to strengthen, complement and improve the deepening of self-knowledge and introspective reflection, leading to the construction of the life project in the community of this educational establishment, keeping in mind the mission of the university is centered on the person.

Likewise, it is sought that students have a preparation and the necessary means to develop their life project through the self-knowledge in favor of their personal and professional development, so that when they finish their university studies they can continue to build it after graduating, since the vast majority of students do not have a life project by reason of they do not know neither have the necessary tools to carry it out, since many institutions do not have people trained about it, and the few that have included such training, their programs do not drive to the development of their life project; therefore, it is intended that educational institutions implement methodologies to help in the preparation and development of a life project based on the new technologies of the 21st century.

From this on el design of a technological tool was made, where group and individual workshops were held with stakeholders and experts through brainstorming and map of agents, to create the proposed models of the mobile application, the development of the UML diagramming tools and Mockups design taking into account the functional requirements previously established by the interested parties, is also showed, the validation the design a thought of black box tests in order for students to fulfill their life project through new technologies, where they feel that the university environment seeks to support them through new alternatives that are closer to their tastes and their daily experience using mobile phones.

Keywords: Life project, Introspective reflection, Self-knowledge, Educational technology, Design Thinking.

1. INTRODUCTION

The present work was carried out as a research project with the purpose of elaborating a proposal directed to the creation and design of technology tool, towards the generation of the life project for the community of the “Universidad Católica de Colombia” institution through the use of Design Thinking, in a way that students get motivated and encouraged to be people who seek to understand yourselves, their skills, their motivation and the path they will follow to fulfill their life project, where students will be allowed to strengthen, complement and improve the deepening self-knowledge and his introspective reflection, in which the access to this knowledge is simple and agile as part of the academic training, not only doing it just as a school project or subject homework but applying it in their day to day, where the creation of this technological tool integrates the entire community of the “Universidad Católica de Colombia” institution.

The research work was framed under the type of technological development project, which aims at the creation, design or significant improvement from the technological, useful and productive point of view, through the materialization of concrete results, in where prototypes generation is possible as well as pilot plants, information technologies development in terms of operating systems, programming languages, data management, communications programs and tools for software development and R & D in tools or software technologies in specialized areas of computer science.[11]

The procedures to be followed was based mainly on the three expected results of the proposal; in the first instance, the gaps and realities of the life project was recognized, in order to identify the needs in a reflective and introspective process, then the high-level design of the computer technology tool was developed, according to the characteristics identified above; finally, the tool designed was evaluated and validated, in order to generate the pertinent requirements that allow the future implementation of the proposal tool.

This proposal is located in the city of Bogotá, Colombia in the “Universidad Católica de Colombia” institution with their undergraduate, graduate and ex-students; it was last for 10 months, starting the last week of July 2019 and ending in the last week of May of 2020, with a continuous follow-up of the research where revisions and the corresponding corrections was made under the accompaniment of the tutor in charge for that purpose.

The problem statement, objectives, methodology are described below; as well as the concepts of reflection, introspection and life project; ending with the expected results of the proposal adding its respective schedule and budget.

2. PROBLEM STATEMENT

2.1 PROBLEM DESCRIPTION

The task of training for academic systems is closely linked to the disciplinary, scientific and methodological knowledge, in an organized and structured the academic descriptors and the specific curriculum proposed, [17] where the absence of a training program on innovation and improvement of teaching and learning processes designed specifically for university teachers. [17]

The Congress of the Republic decrees In the general education law (law 115 of 1994), where according to its First Article has for object that "education is a process of permanent, personal, cultural and social formation that is based on an integral conception of the human person, of his dignity, of his rights and of his duties", [13] and in the article 109 is about getting a higher educational quality system, scientific and ethical; where theory and pedagogical practice are developed as a fundamental part of educator's knowledge, strengthening research in the pedagogical field and the specific knowledge; preparing in this way university and postgraduate level educators in order to supply all the educational needs for each tier in every institution. [13]

The Ministry of National Education through his bill 112 in which the higher education system is organized and the public service provision of higher education is regulated, in which through its Article 75 it is understood that "higher education institutions will advance and implement welfare programs in which academic community participates, leading spaces that propitiate a better use of free time and attend other areas such as health, culture, human development and sports. These programs will promote the integral formation of the student, the educational inclusion and their competence to associate their training programs with their life project" [28]

From its origins, the university has been the field of creation and transmission of knowledge. The compliance of this mission has meant the permanent generation of processes that guaranteed both the production and the appropriation of this knowledge, by a group of people.[41] The creation, development, transmission and dissemination of knowledge, as well as the other traditional functions of universities to investigate, teach and spread new knowledge, has given them a central role in this knowledge society. [23]

At present, one of the essential functions of universities is the construction of new knowledge. These institutions promote investigation spaces, where the various academic groups participate in the generation of new knowledge, Burton Clark points out that there are two forms of knowledge that allow the integration of teaching and

learning: the tangible, which is the transmission of knowledge and skills, the intangible, which expresses qualities and is acquired through investigation participation. [4]

For universities it is a challenge today, not only to design a professional skills enhancer curriculum, which implies changes in the teaching and learning paradigms, but also conceive the formation and development of generic and specific skills in their interrelation in the process of professional training, [24] equally, training their students, in a perspective in which learning is a life-long task, for a productive career and for citizenship. Universities must be increasingly aware that their mission is in permanent transformation, its vision in constant effervescence and that its leadership in the field of the elaboration and transmission of knowledge requires a new sensitivity towards social changes. [41]

The “Universidad Católica de Colombia” institution conceives education as an act of intelligence and freedom of the person and, therefore, of a moral nature. It appears before to the world as the origin of intellectual and free actions and develops in his community the virtue of studiositas, so that you learn to think and promote creative and innovative power, as well as the acquisition of knowledge, skills and abilities. [40]

According to statistics from the labor observatory for education, there were 4,290,760 graduates in Colombia; in 2015, the student community of “Universidad Católica de Colombia” had got an 88.2% of employment link with a monthly income average of \$ 2,806,712 and in 2016 it obtained a rate of 83.1% with a monthly income average of \$ 3,737,042; which means over the years the students of this university have gotten a good acceptance when accessing to the working market and the income average has been increasing monthly [29] In April 2019, the employment rate in Colombia was 55.8%, decreasing 2.7 percentage points compared to April 2018 (58.5%), while the unemployment rate was at 10.3%, showing an increase of 0.8 percentage points over the same month last year (9.5%) (See Figure 1), having an overall participation rate of 62.2%, which represented a fall of 2.4 percentage points compared to the April 2018 (64.6%) [15]

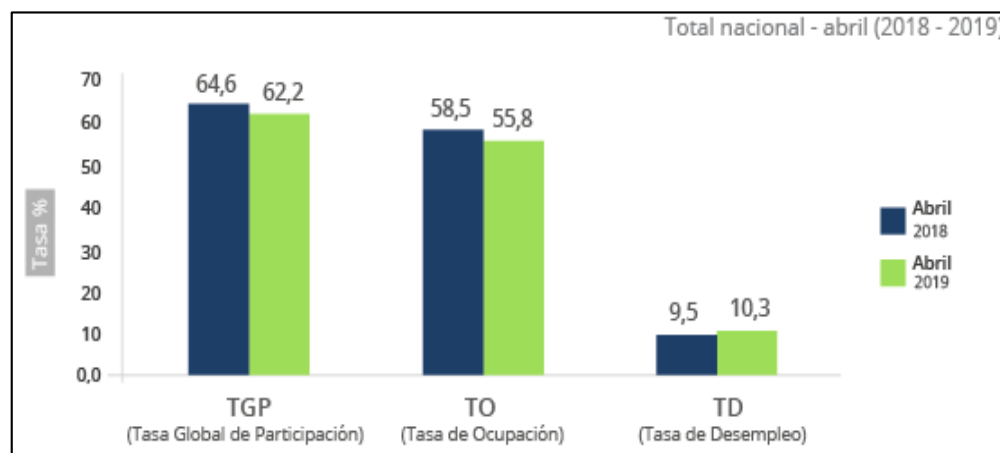


Figure 1. Global rate of participation, occupation and unemployment (2018-2019). [15]

The employment rate for people between 14 and 28 years old from February to April this year was 46.2%, which represented a decrease of 1.5 percentage points with respect to the same period in 2018 (47,7%). About the unemployment rate of the young population we met an 18.5%, which indicates an increase of 1.5 percentage points compared to the same period in 2018 (17%) (See Figure 2). [16]

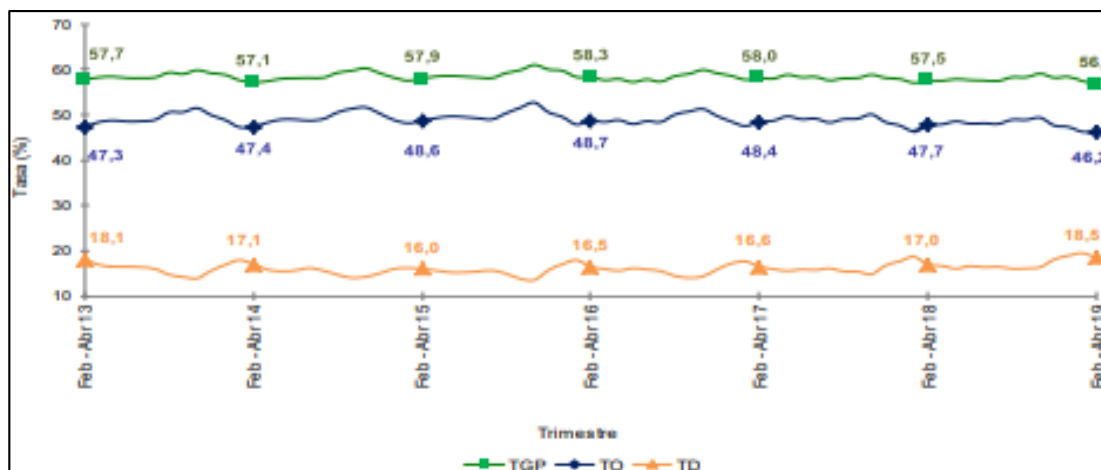


Figure 2. Global rate of participation, occupation and unemployment of the young population (2013-2019). [16]

The “Universidad de Córdoba” (Spain) develops a study with the students of the last semester of the Psychopedagogy Bachelor's program in the Professional Guidance class, where this activity considers a study sample of 59 students (49 women and 10 men). It was evident that for these students the way to achieve their professional project was through the next three important characteristics: Training (57.63%), techniques and strategies to seek information and employment (38.98%) and personal qualities (interest, vocation, perseverance, availability) (27.12%); it means, although students consider that their training and job search strategies are important, their qualities represent a great relevance when developing their professional project and it is a bigger guarantee of success when accessing to working life. [32]

Currently students are disadvantaged when wanting to start the job life, because the businesspersons increasingly demand "competition", which is an own composition of each individual that combines training and qualification, acquired for technical and professional training, aptitude for teamwork, initiative, a taste for risk. Most definitions of professional competence are not limited to the set of skills or abilities required to perform properly in a given context, neither to the simple execution of tasks, but also involves a combination of attributes with respect to know, knowing to do, known to be and know how to be, [7] equally the importance of emotional competencies of a person who is looking for a job opportunity grows up, in some cases even more than professional aptitudes. These competences point to the

relationship with oneself (self-awareness, self-control, motivation) and relationships with the others (emphatic capability and social skills). [9] According to Olivares this occurs due to it gives to the subject has the ability to analyze, understand, take decisions and solve its own problems; in the same way the vocational election process that is gradually developed and consists of a personal and individual construction task. [32] Being creativity a fundamental piece as it determines the character of the creative product of each person, inasmuch as it is the interrelation between qualities or individual traits and its cognitive-affective processes with certain characteristics of the social environment and its surroundings; these dimensions interact inside the conceptual model of the creator professional development. [14]

The pedagogue Julián de Zubiría proposes the creation of the life project subject in the universities, which will be worked on during the first semester. This one would be a space that would help young people to know and understand themselves and the others; where both the autobiography and the project of the student's future life would be addressed, in order to strengthen intrapersonal and interpersonal intelligence and develop self-understanding and understanding of the others and the context. The great universities of the world such as Harvard, Stanford and Yale have already taken this step; they have created subjects with the purpose of helping young people to think about themselves and the key factors of their lives. It was called "Designing your life" at Stanford and Psychology and Good Life at Yale University, which turned out to be the most popular course. It should be considered, if one of each four current students of the university signed up for the chair, it is due to emotional needs has not been assisted yet, we remain in debt with their integral formation; what makes us understand that the final aim of any educational process must be the generations of better citizens. [18]

Equally, the student orientation program that is carried out at the Center for Counseling and Psychological Care (COAP) "Alfonso Bernal del Riesgo" of the Faculty of Psychology of the "Universidad de la Habana" institution, it begins to be offered in the 1997-1998 course, a service through which guidance is provided to middle school students who request it for the professional election process as well as to university students who present conflicts in their motivation professional. [22]

Higher education takes many years under a teaching model in which the teacher had the fundamental role and students were subject to their class notes or a reference manual, so memorization was originally the most important, commonly known as master classes. Starting from new technologies, teaching methods and techniques that are usually distinguished begin to be questioned, conducting education to a great renewal, due to the creation of the new European Higher Education Area where a new way of learning is being devised, since cooperative and autonomous learning methods prevail and practice has priority over theory, and new technologies occupy an essential place, since they are necessary in a large

part of the students formation, so universities face the arrival of students who demand new technologies for teaching, becoming into a main goal in the process of training university students, [31] in addition, if we talk about a conception of lifelong learning, we should consider the idea of assessing the pedagogical competence of teachers as well as scientific competence in the current context of university education, where in turn, vindicate and encourage their motivation and recognize the efforts aimed at improving quality and educational innovation. [7]

In Europe, the Tuning Project had been an exclusive experience, an achievement of more than 135 European universities, which since 2012 have carried out an intense work aimed at the creation of the "Espacio Europeo de Educación Superior". Tuning involved in Europe a great challenge for higher education institutions, since it allowed the creation of a work environment so that academics could reach points of reference, understanding and confluence. Tuning is an internationally recognized methodology, a tool built by universities for universities, an instrument that allows us to think that the "Espacio Europeo de Educación Superior" can be an increasingly closer reality. [23]

Tuning Latin America begins in 2004 with the objective of promoting reflection and exchange among professionals in higher education in Latin America, from a position of respect for the autonomy and diversity of each region and academic culture, around the improvement of university teaching and learning processes oriented to the integral formation of the student from a competency focus, [24] additionally, following its own methodology, Tuning-Latin America has four main lines: competencies (generic and specific to the thematic areas); teaching, learning and evaluation focusing; academic credits; and quality of the programs. [23]

The pedagogical model that involves the training by competences proposes to overcome the barriers between school and daily life in the family, work and community, establishing a common thread between daily, academic and scientific knowledge. Therefore, by merging them, it raises the integral formation that encompasses knowledge (cognitive ability), skills (sensory-motor capacity), skills, attitudes and values. In the notion of multiple intelligences, it confirms that competencies are not innate, neither predetermined. You are not born destined to develop a competition. People, with their intelligence, are in a position to develop constructions, based on the requirement of the environment, which gives them multiplicity of stimuli. Therefore, they can develop specific capacities. [21]

The International Telecommunications Union (ITU) shows that 74% of households in developed countries have a computer and 71% have Internet, while in the rest of the world percentages are between 25% and 20%. In 2006, 82% of the world's population did not use the Internet and in 2011, it was reduced to 65%; then the number of mobile telephone subscribers for that year was evaluated at 5.9 billion, where we live approximately 7,000 million people in the world. It shows the

difference in access to technology such as computers, mobile phones or the Internet, it is an event never seen in the history of humanity with other types of technologies. [20]

Incorporation of these technologies in Higher Education supports a highly competitive university that seeks to enhance lifelong learning, which will affect the strengthening of the quality and the expansion of conventional universities, making them more flexible and helping with the easier entry of students that are usually "segregated", seeking the fulfillment of their functions thanks to the combination between several modalities connected by the communication networks. [6]

At the beginning of 2009, in the city of Medellin, a non-probabilistic sampling is carried out by quotas in order to inquire about the use of available resources on the internet, that can be used by students for social and entertainment purposes so much more than for academic topics (See Table 1); a sample of 940 students from the following universities is taken for this: "Instituto Universitario Tecnológico de Antioquia", "Fundación Universitaria Luis Amigo" and "Universidad de Antioquia".[34]

MOTIVATIONS	ENGINEERING AND TECHNOLOGICAL STUDENTS (%)	STUDENTS DIFFERENT FROM ENGINEERING AND TECHNOLOGICAL(%)
Education and learning	40	42.8
Entertaining	58	81.2
Curiosity	48	65.9
News	26	44.2
Get new friends	22	57.2

Table 1. Motivations to participate in social networks. [34]

From this, it is notorious that entertainment and curiosity are the main reasons for university students to check social networks; but it should be noted too that education and learning also have a high motivation for students, having a percentage equal to or greater than 40 %.

In the use of mobile devices, we must take into account the influence of technology over people's minds, because not only affects the sense of space and time, but the identity, privacy and imagination. Design Thinking seeks to support the development of methodological capacity with originality and creativity, this is a bold and powerful auxiliary resource for the generation of methodologies in the design of processes for learning, applying this technique for the creation of processes using resources that propitiate or facilitate its study. This method cannot be taught in a habitual way, it can not only be read and memorized, it is necessary to create methodologies through itself; in this task the learning to learn processes takes a place, because without it it's not possible to achieve metacognition to add strategies, resources and

exercises to provide the acquisition of skills and knowledge through software technologies in their Apps mode. [37]

The “Instituto Técnico de Buenos Aires” (ITBA) created a project with the aim of ensuring that the product to be developed is accepted by the student community, their opinion should be ensured in all its stages, therefore, it was thought to work with two methodologies: The first one about the knowledge of students which was made through "Design Thinking" and the second one for the construction of the product using the agile SCRUM methodology; reason why it was decided to have a mobile application where the final version was launched at the beginning of the school year in 2017. Among the main functions, students can consult their average, credits per course, career advance, pending final exams, current account status, invoices, payments, classroom changes, notes and events. Moreover, the student can check available classrooms to study in groups at any time, and every week they conduct surveys with daily issues that affect student community. The acceptance of this app was very good, only twenty days after the launch, almost all of the students (98%) had downloaded the application. Choosing to carry out the "Design Thinking" process prior to start the project development helped the team to know more about the students' interests, and their participation from the beginning of the project was a key as they were surprised because they could choose what they wanted and how they wanted it, without receiving any approval from academic staff in the university; these conditions contributed to the successful and rapid deployment throughout the student community. [3]

2.2 PROBLEM FORMULATION

What are the components for the design of a technological tool for the life project that promotes the generation of an entrepreneurship idea, according to its functional and non-functional requirements, on the projection of the “Universidad Católica de Colombia” institution?

3. JUSTIFICATION

The university education must provide the student with a set of knowledge necessary for their future professional exercise, so that it is attended to the development of professional competences. But this knowledge must provide them through learning and teaching contexts in which they allow the university student to appreciate as a set of values as ideals, such as seriousness, rigor and doubt, criticism and self-criticism, determination and self-improvement in the face of difficulties in understanding, analysis and synthesis, [27] In addition to building your own matrix of values that allows you not only to reason and think about them, but to develop personal criteria guided by principles of justice and equity, as well as acting in a manner consistent with his professional practice and as a citizen. The model of formation in values identified as «ethical learning», aims to integrate the construction of the moral personality and the development of certain skills and dimensions of the person. [27]

It can be deduced then that one of the main trouble that university students and graduates face is that they do not know neither have the tools needed to carry out a useful life project; reason why they are being affected, since they don't know the required qualities to be a competitive 21st century professional; where students must be motivated and encouraged to be people who seek to know who they really are, their capabilities, own motivation and the path they are going to follow to fulfill their life project; this as a result of the fact that many institutions don't have properly trained workers and the few that have received a right formation do not lead to the elaboration of a life project, therefore it is sought that educational institutions adopt methodologies that help the creation and development of it.

The investigate work will be framed in the “Universidad Católica de Colombia” institution in the city of Bogotá with the educational community of that institution; pursuing that the students elaborate their life project through the knowledge of themselves for their personal and professional development. It will be measured by the achievements made framed by professional ethics, principles, values and knowledge of the characteristics of the person (qualities, defects, strengths, weaknesses and emotions) and as a result students will have the appropriate preparation and the necessary means to develop his life project; so that when they finish their university studies they can continue building it through their status as professionals; being students the main beneficiaries at the end, and secondly, the “Universidad Católica de Colombia” institution would stand out from other institutions of higher education not only for academic aspects but for the integral development of the person.

4. OBJECTIVES

4.1 GENERAL OBJECTIVE

Develop a functional virtual notebook design for introspective registration in the search for ideas that generate entrepreneurship of the “Universidad Católica de Colombia” institution by using Design thinking.

4.2 SPECIFIC OBJECTIVES

- Characterize the entities functional that make up a virtual notebook design for introspective registration in the search for ideas that generate entrepreneurship through the identification of functional requirements.
- Design the prototype through UML diagramming tools and Mockups design to validate functional requirements.
- Validate the prototype design based on functional tests and quality protocols.

5. CONCEPTUAL FRAMEWORK

Throughout this document, a set of basic terms are used, which are the bedrock of the investigation, so that an approximation is made to the concept of reflection, introspection and life project, according to the interpretation of different authors. Furlong states that there are three main basic processes in teaching: intuitive, reflexive and analytical-objective thinking (See Figure 3).

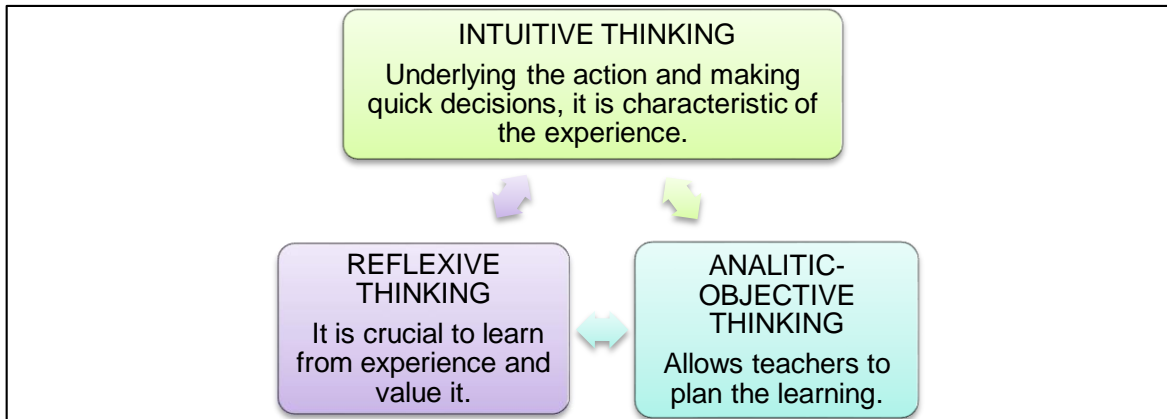


Figure 3. Teaching Processes

But what does the concept of reflection refer to? According to the intervention of five authors (See Figure 4) it can be noted this term has multiple interpretations; nevertheless, in spite of this we can see the convergence into a same final idea: Reflection is a bridge that gives clarity to reflections and orientates them, showing interest in conscious reflection, which is a promoter of internal dialogue and the social communication capability through personal experiences.

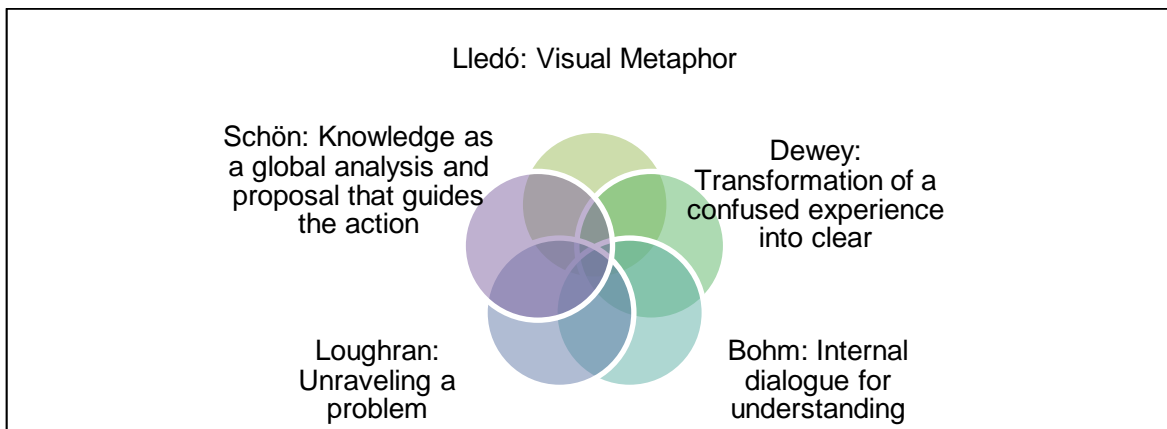


Figure 4. Definition of reflection pursuant to authors. [43]

In order to analyze the global meaning of reflection, three different kinds are distinguished (See Figure 5): Introspective reflection (oriented to the inquiry; daily experience characterizes it, pours its vision of the events that characterize its practice and the context in which it is carried out, issuing value judgments about such events), interrogative reflection (directed to the declaration; due to it answers in a reflexive way to the questions posed, is characterized by the memories - interviews) and group reflection (driven to the interaction; since they confront points of view and make criticisms of greater or less depth, it is characterized by the records of the job team meetings), the strategy used for this analysis was to confront these three forms to find points of agreement and divergence that would provide credibility to the judgments we emitted about it. [43] Schön describes the perception process of the problem, which is inherent to the search process of the solution, where it focuses on the field of conscious reflection; and capable of integrating rational and reflective thinking, that generates theoretical and contextual-practical knowledge that can be made explicit. Therefore, we integrate both ways of thinking by providing consciousness to knowledge; highlighting the concept of metacognition, since professional development is stimulated by successive metacognitive self-regulation processes (based on reflection and understanding of what the person thinks, feels and does) and self-regulation and changes control processes. [42]

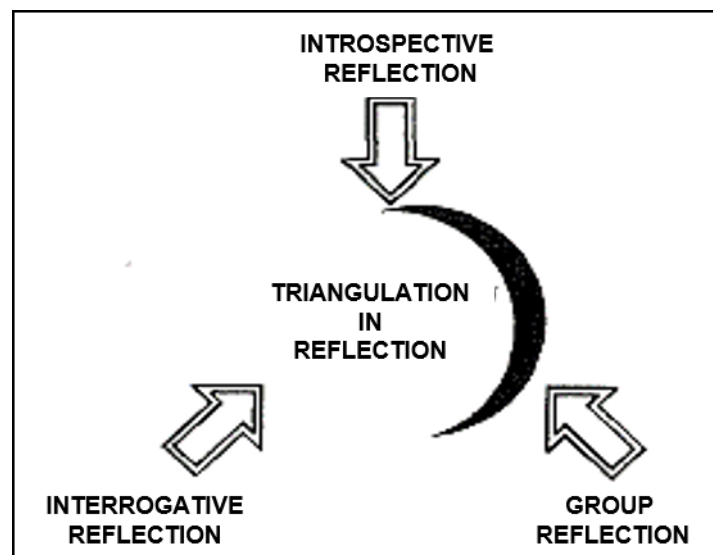


Figure 5. Reflection Analysis Triangulation. [43]

The purpose of the life project is: The understanding of the intimate personal experience and the contribution in the construction of the learner's identity, characteristic notes that are incorporated and developed in the formation of the person, contributing in the reflection and introspection (meditation to put in silence the interiority to emerge the true self, overcome the ego, with the transcendent sense of life) on the characteristic notes of the identity of the apprentice, answer the question: who am I? and whom am I for?, conditions that enable the reflection and

drive it into deep and existential questions, oriented to have an answer in front of transcendence and the vocational sense foreseen by God. Participation and development with the person is fundamental to not lose sight of the substantial characteristics of the identity and intimacy that comprise and develop the formative process, accompanying in the reflection and discernment on the intuition of personal intimacy, which leads to think about the special relationship with oneself in which the meaning of one's own personality is played and in this, the understanding of its context and its transcendent meaning, which by reason of its everyday life the educator is confronted; and about which begins in this exercise of knowing everything and oneself. [12]

From a pedagogical point of view, it is estimated that digital portfolios are didactic instruments for pedagogical innovation, by facilitating the reflection and knowledge construction, the planning of educational tasks, individual responsibility and introspection, collective intelligence and the personalization of the formative processes on the part of the student. [8]

6. THEORETICAL FRAMEWORK

Two key forms are contemplated for the execution of this project, which contains elements aligned with the specific objectives of the project, which allows demonstrating the variety, types or characteristics; the techniques to be used are demonstrated straight away:

6.1 SOFTWARE ENGINEERING.

Software Engineering is formed by a process, a set of methods (practices) and an arrangement of tools that allows professionals to develop high-quality computer software, according to the intervention of two authors you can show their contribution about the Software Engineering (See Figure 6) [35]

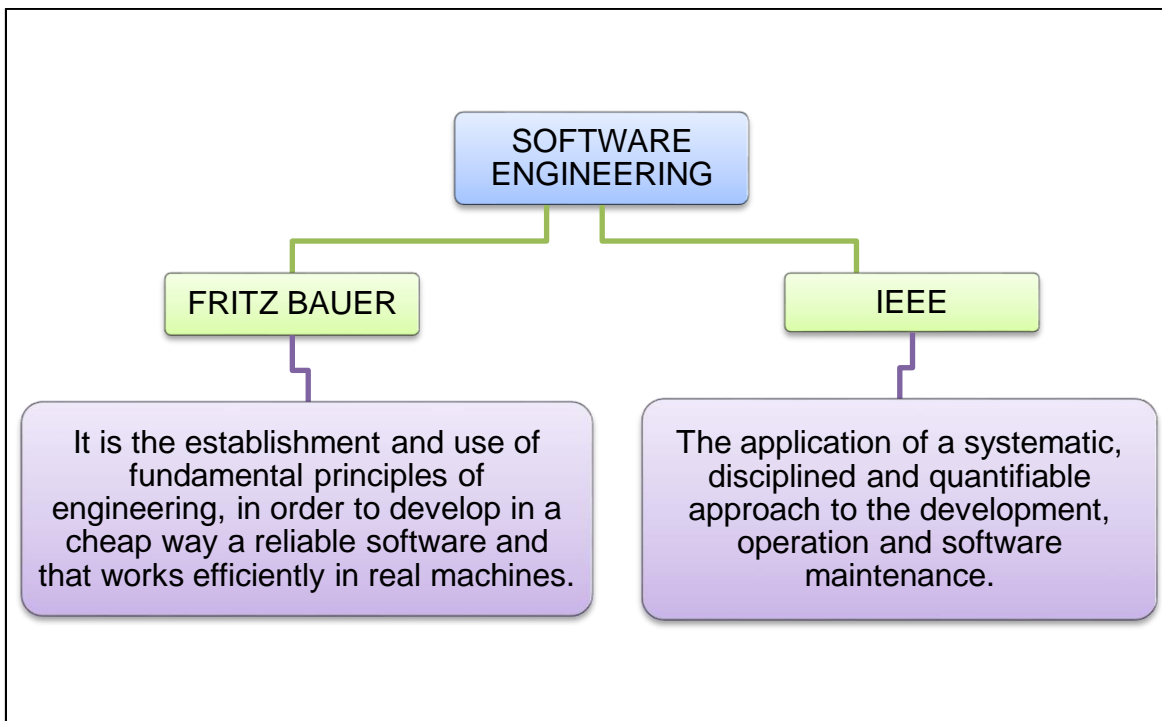


Figure 6. Software Engineering Definition

This term is important because it allows us to build complex systems in a reasonable time and with high quality, from the point of view of a software engineer; the final product is the set of programs, content (data) and other finished products that make up the computer software, but from the user's perspective, having this a technology with a four-layer approach in its process (See Figure 7). [35]

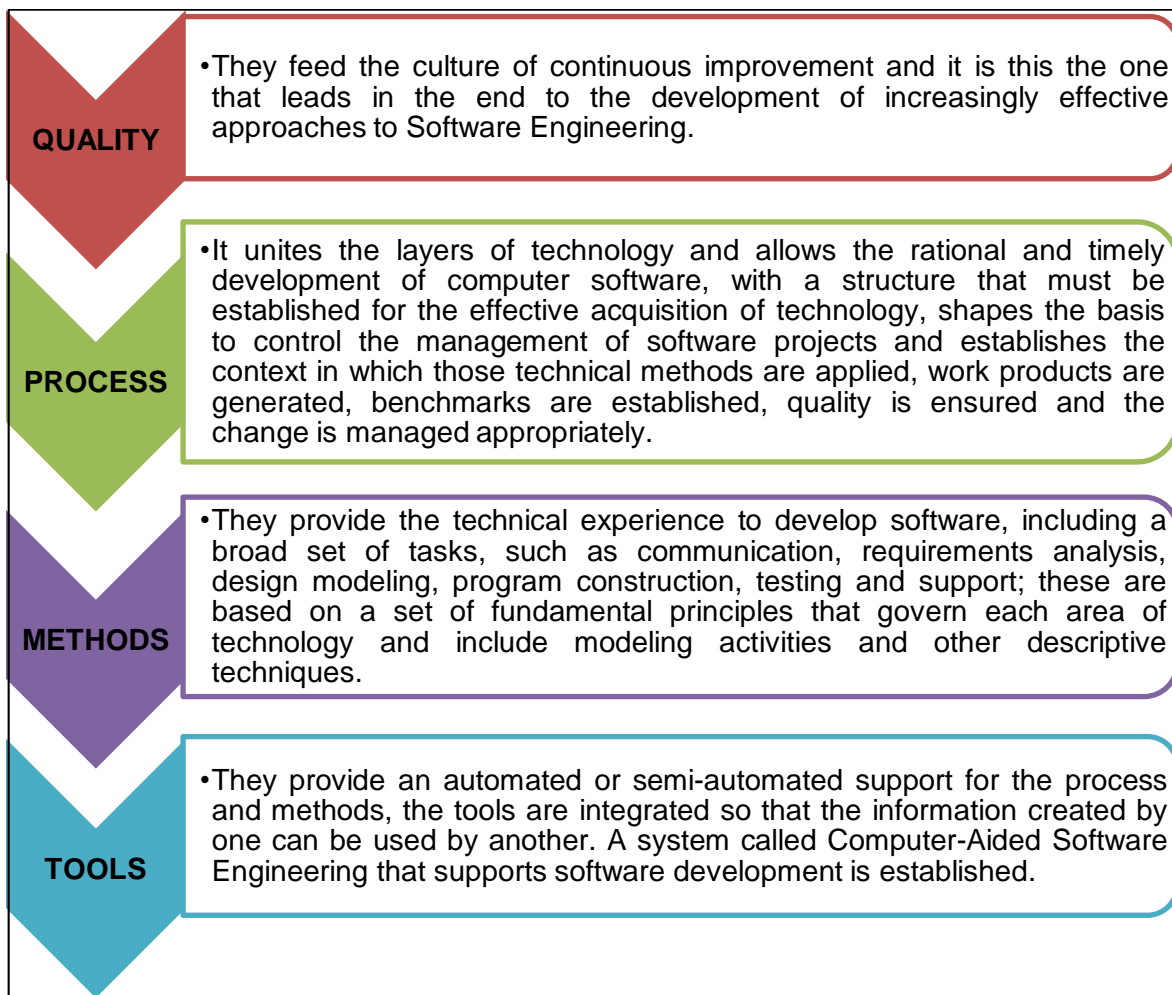


Figure 7. Layers of Software Engineering

The end-product is the resulting information which somehow helps for good its surrounding; obtaining essentially four important parts for the software engineering practice (See Figure 8) [35]

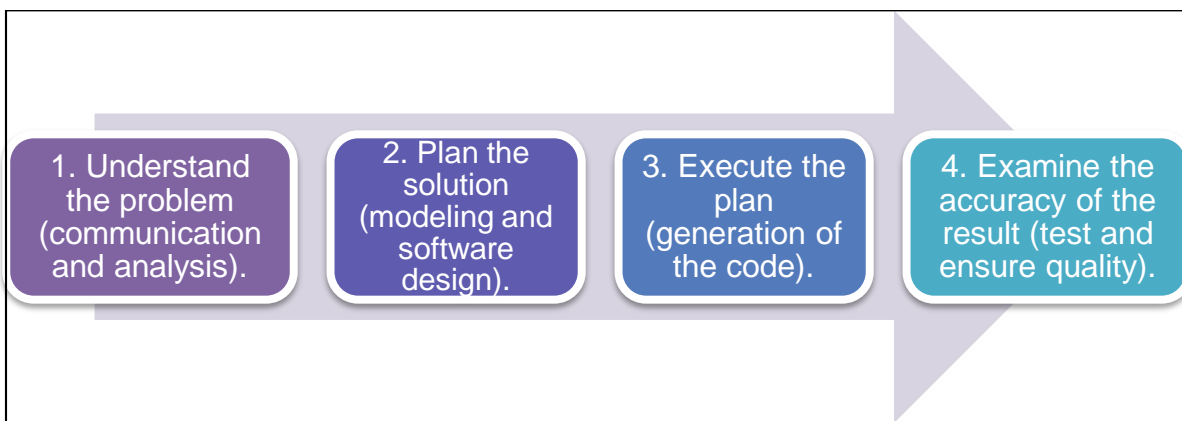


Figure 8. Essence of Software Engineering practice

The MeISE Educational Software Engineering Methodology proposes a life cycle divided into two stages. The first one contemplates the definition of requirements, analysis and preliminary design, during which the characteristics that are intended to be achieved with the product, the pedagogical requirements, the communication and the architecture on which the software will be built are determined in a global manner, and it ends with a plan of iterations programmed taking care that the product released at the end of each one is didactically complete, what means that it completely covers some of the didactic objectives of the software. Once these guidelines are established, the second stage begins, in which the product is developed, so that the team takes each iteration, designs, constructs, tests and implements it, evaluating at the end the convenience of proceeding with subsequent iterations until a complete product is obtained. [1]

6.2 EMOTIONAL-AFFECTIVE COMPUTING.

Its main objective is to capture and process emotional information in order to improve communication between the person and the computer, while emotional mediation attempts to minimize the filtering of emotional information that communication devices perform, due to they use to be dedicated to transmit verbal information instead of nonverbal. Emotional resources such as emotional databases that are very suitable for the training of emotional applications, both for recognition systems and for emotional synthesis. These emotional resources are usually multimodal and usually contain images, sounds, psychophysiological values, etc. The emotional databases end being pretty useful when developing emotional computer systems. They are used mainly in systems of recognition of emotions, but they can also be used to develop emotions synthesis systems. [26]

The objective of Affective Computing is the development of devices and systems capable of recognizing, interpreting, processing and/or simulating human emotions in order to improve the interaction between the user and the computer. These "affective" systems, thus, must be able of: First, capturing and recognizing the emotional states of the user through measurements on signals generated in face, voice, body or any other reflection of the emotional process that is being carried out; second, to process that information by classifying, managing, and learning through algorithms responsible of collecting and comparing a great quantity of cases, and that take into account the emotional states of the user; third, generate the corresponding answers and emotions, which can be expressed by means of different channels: Colors, sounds, robots or virtual characters endowed with facial expressions, gestures, voice, etc. [5]

7. STATE OF THE ART

Technological surveillance and competitive intelligence were developed with the aim of offering a study associated with a virtual notebook design in relation to the reflective construction of the life project in search of entrepreneurial ideas.

Technological surveillance is a function that consists of analyzing the innovative behavior of direct and indirect competitors, exploring all sources of information (books, gray literature, patent offices, etc.), to examine existing products on the market (analysis of incorporated technology) [30] being a method of systematic accumulation and analysis of data from which forecasts can be made. [33]

On the other hand, competitive intelligence is required for decision-making, the improvement of information, both quantitatively and the search for greater involvement of personnel in the company and its results [33] being a set of concepts, methods and tools that serve to develop, in a coordinated manner, the activities of search, obtaining, analysis, storage and dissemination of relevant information for decision-making in the organization, according to its strategy acting. [30]

The competitive intelligence and surveillance function is like an early warning system working as a radar that exercises constant and extensive tracking or that collectively locates and organizes individual efforts on events that may be relevant to the company must do technological surveillance and competitive intelligence. [33]

7.1 SOURCES OF INFORMATION CONSULTED.

In relation to the required information, the following search engines have been consulted (See Table 2):

SOURCES	DEFINITION
PatentScope	World Intellectual Property Organization which allows the international search of patents online.
Patent Lens	Provided by Cambia, an independent international non-profit organization dedicated to democratizing innovation, a platform that searches for patents and official online documents.
Scopus	Bibliographic database of abstracts and citations of articles from scientific journals, which allows multiple filters to be performed and the information to be exported to be processed and displayed in other programs.
Scielo	Electronic library project for complete editions of scientific journals, an initiative of the Foundation for Research Support of the State of São Paulo, Brazil and the Latin American and Caribbean Center.
Scimago Journal Rank	Measure of the scientific influence of academic journals that explains the importance or prestige of the journals from which the citations come.

Table 2. Sources of Information Consulted

7.2 SEARCH EQUATIONS.

To carry out the study, the use of carrot2 was used to structure the search results in topics with an instant description of what is available for keywords to improve searches in the identified databases, which genre as a result of the following scheme (See Figure 9)

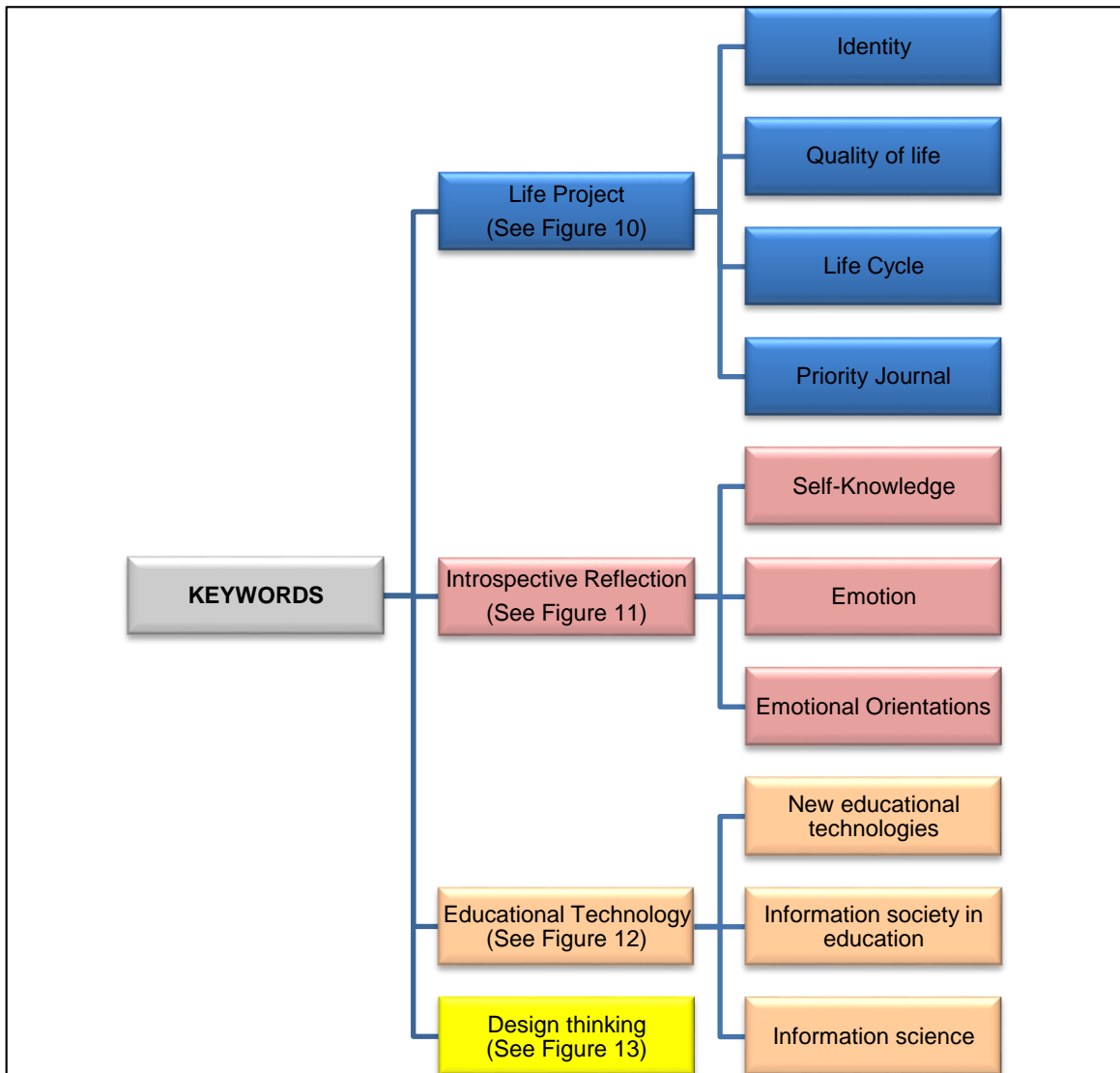


Figure 9. Keywords

Taking into account the word key to “life project” are the following series of synonyms (See Figure 10)

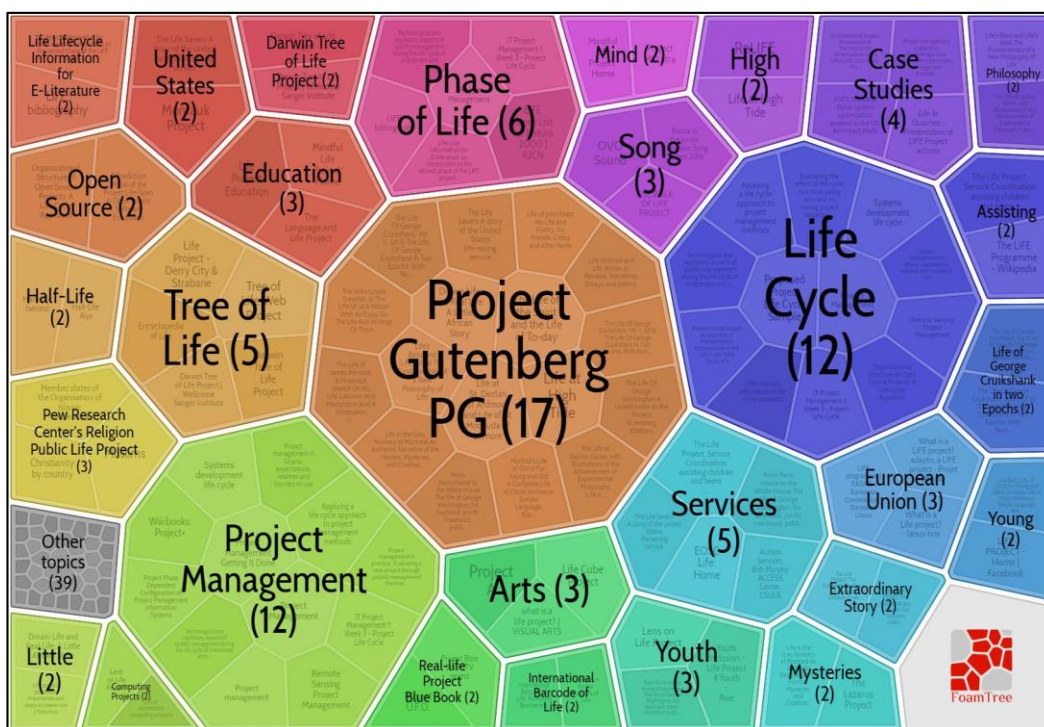


Figure 10. Life Project Keyword

Taking into account the word key “educational technology” are the following series of synonyms (See Figure 11)

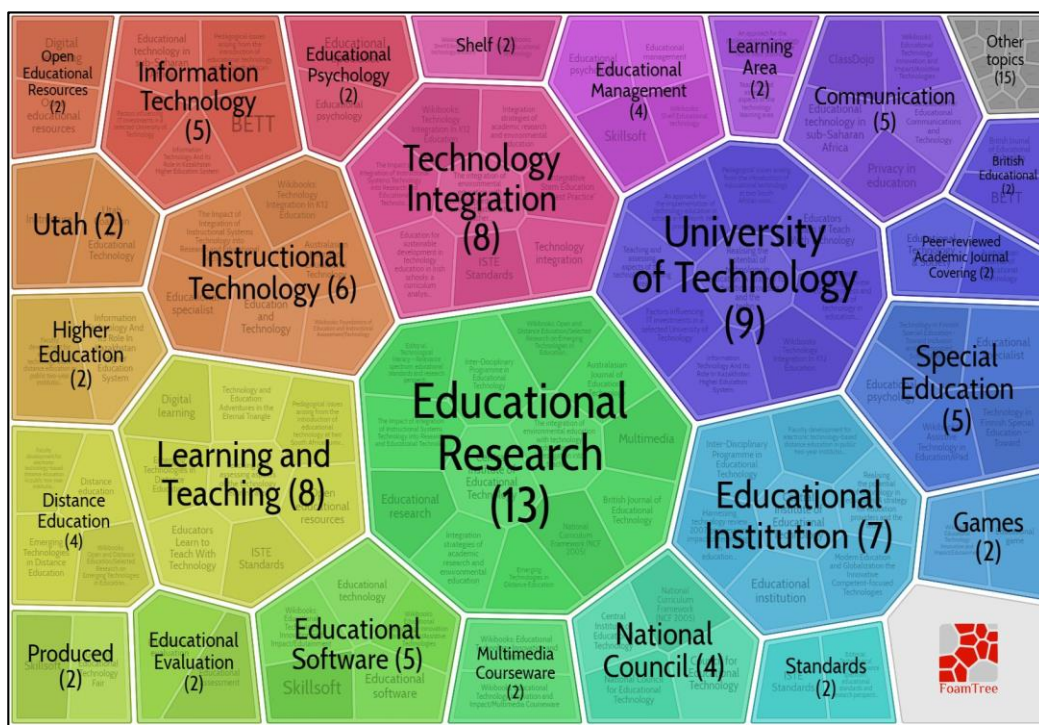


Figure 11. Educational Technology Keyword

Then five general equations are generated for searching the different databases, taking into account the keywords defined above (See Table 3):

N°	SEARCH EQUATIONS
1	(life project) AND (educational technology) NOT (medicine) NOT (healthy) NOT (chemistry) NOT (pharmacology) NOT (physics) OR (Students) OR (Teaching) OR (Education) OR (Internet) OR (Engineering Education) OR (Technology) OR (Learning) OR (Higher Education) OR (Computer Science) OR (Education Computing) OR (Educational Technology)
2	(life project) AND (educational technology) AND NOT medicine AND NOT healthy AND NOT chemistry AND NOT pharmacology AND NOT physics
3	(life project) OR (introspective reflection) AND (educational technology) AND (design thinking)
4	(life cycle) AND (design thinking)
5	(life project) AND (educational technology)

Table 3. Search Equations

7.3 WAYS TO CARRY OUT THE ANALYSIS.

The analysis of the results will be carried out according to a matrix where the results data of the selected databases will be recorded, which will be handled as follows: the search equations diligence according to the previously selected equations and the search sage (n) it will be completed according to each database establishing the results for each formula and feeding the results according to the planning established in the schedule.

According to the results, the search equations should be refined minimizing the errors, and the summaries should be read according to the data obtained, to then export the results and later store the information on the drive and USB according to each query, in addition, the 10 most relevant articles with the theme of the project for surveillance should be prioritized according to the summaries of the documents found.

7.4 RESULTS OF THE DIFFERENT SEARCHES

7.4.1 Search Result in Scimago Journal Rank Database. A review of the measure of the scientific influence (ranking) of academic journals related to the subject of study is carried out, using the following filter:

Social Sciences ▾

Education ▾

All regions / countries ▾

All types ▾

2018 ▾

Then the first 10 magazines related to the research topic are obtained (See Figure 14).











	Title	Type	↓ SJRI index	H index	Total Docs. (2018)	Total Docs. (3years)	Total Refs. (2018)	Total Cites (3years)	Citable Docs. (3years)	Cites / Doc. (2years)	Ref. / Doc. (2018)	
1	Review of Educational Research	journal	5.509 Q1	132	24	88	2827	1080	86	11.86	117.79	
2	Educational Evaluation and Policy Analysis	journal	5.021 Q1	67	30	103	1695	446	100	4.39	56.50	
3	Sociology of Education	journal	4.334 Q1	82	16	59	1082	278	52	4.57	67.63	
4	Educational Researcher	journal	3.621 Q1	112	50	143	1955	750	131	4.52	39.10	
5	Journal of Educational Psychology	journal	3.459 Q1	177	113	235	6214	1368	222	5.75	54.99	
6	Education Finance and Policy	journal	3.308 Q1	18	15	63	606	173	61	2.64	40.40	
7	Internet and Higher Education	journal	3.307 Q1	75	25	101	1456	945	99	7.78	58.24	
8	American Educational Research Journal	journal	3.176 Q1	103	52	158	4128	647	143	3.84	79.38	
9	Developmental Review	journal	3.123 Q1	78	34	59	4518	447	58	5.77	132.88	
10	Journal of Engineering Education	journal	3.032 Q1	93	33	86	1786	469	65	7.69	54.12	

Figure 14. Ranking of the Top 10 Academic Journals Related to the Research Topic [38]

7.4.2 Search Result in PATENTSCOPE Database. A review of patents related to the subject of study is carried out, obtaining the following result (See Table 4) according to the respective search equations:

N°	SEARCH EQUATIONS	PATENT-SCOPE
1	(life project) AND (educational technology) NOT (medicine) NOT (healthy) NOT (chemistry) NOT (pharmacology) NOT (physics) OR (Students) OR (Teaching) OR (Education) OR (Internet) OR (Engineering Education) OR (Technology) OR (Learning) OR (Higher Education) OR (Computer Science) OR (Education Computing) OR (Educational Technology)	1.879
2	(life project) AND (educational technology) AND NOT medicine AND NOT healthy AND NOT chemistry AND NOT pharmacology AND NOT physics	1.879
3	(life project) OR (introspective reflection) AND (educational technology) AND (design thinking)	194
4	(life cycle) AND (design thinking)	22.693
5	(life project) AND (educational technology)	21.065

Table 4. Search Results in PATENTSCOPE Databases

7.4.2.1 Search Equation 1 and Search Equation 2. 1,879 results were found where the country with the most publications made according to equation 1 is the United States of America, with International Business Machines Corporation being the company that has had the most publications on the subject and in 2018 with the highest number of publications executed (See Figure 15), when developing the search with equation 2, I return the same result given in equation 1.

Países		Solicitantes		Inventores		código CIP		Fechas de publicación	
Estados Unidos de América	1.204	International Business Machines Corporation	50	Beckham Carol T.	20	G06Q	648	2011	93
PCT	357	Samsung Electronics Co., Ltd.	41	Bishop Michael	20	G06F	644	2012	68
Oficina Europea de Patentes (OEP)	105	SAMSUNG ELECTRONICS CO., LTD.	39	Frank Scott M.	20	H04L	146	2013	86
Canadá	93	Facebook, Inc.	36	Short Shannon M.	20	H04N	135	2014	98
Australia	83	Facebook, Inc.	36	McLendon Martin L.	18	H04W	130	2015	96
Reino Unido	16	SAMSUNG ELECTRONICS CO LTD	21	Meadows Vernon	15	G09B	122	2016	106
China	4	FACEBOOK, INC.	15	Arena Christopher M.	11	G06N	68	2017	111
Israel	4	AT&T Intellectual Property I, L.P.	13	Horowitz Kenneth A.	11	G06T	62	2018	136
Japón	4	AT&T Intellectual Property I, L.P.	13	Lucas J. Myslinski	10	A61B	59	2019	111
Nueva Zelandia	3	BANK OF AMERICA CORPORATION	13	Barnard Ray F.	9	H04M	55	2020	28
		AT&T Mobility II LLC	11						
		Lucas J. Myslinski	10						

Figure 15. Search Result of Equation 1 and 2 - PatentScope

7.4.2.2 Search Equation 3. 194 results were found where it is evident that the country with the most publications made according to equation 3 is the United States of America, with Forcepoint LLC being the company with the most publications on the subject and the year 2015 with the most publications executed (See Figure 16).

Paises		Solicitantes		Inventores		código CIP		Fechas de publicación	
Estados Unidos de América	136	Forcepoint, LLC	12	Espinosa John Christian	7	G06F	86	2011	7
PCT	41	ASPEN PERFORMANCE TECHNOLOGIES	10	Ratcliffe, III Chester Randolph	7	G09B	48	2012	13
Canadá	14	FORCEPOINT, LLC	5	White Christopher Dyson	7	G06Q	38	2013	13
Australia	2	PodOp, Inc.	5	Christopher Poirel	6	G06N	26	2014	14
Oficina Europea de Patentes (OEP)	1	Right Brain Interface NV	5	Eduardo Luiggi	6	H04L	26	2015	18
		MINDSIGHTMEDIA, INC.	4	Jose Roberto KULLOK	6	A61B	20	2016	16
		PSYLERON, INC.	4	Phillip Bracikowski	6	H04N	20	2017	3
		Vandormael Philip W. J.	4	Saul KULLOK	6	A61M	9	2018	10
		ZHENG ZHILIANG	4	William Renner	6	A63F	8	2019	15
		ADVANCED BRAIN MONITORING, INC.	3	Ann Irvine	5	B25J	6	2020	14

Figure 16. Search Result of Equation 3 - PatentScope

7.4.2.3 Search Equation 4 and Search Equation 5. 22,693 results were found according to equation 4 and 21,065 results in equation 5, which coincides with the country with the most publications made in the United States of America, with Silverbrook Research Pty Ltd being the company with the most publications on the subject and the year 2019 with more publications executed (See Figure 17).

Paises		Solicitantes		Inventores		código CIP		Fechas de publicación	
Estados Unidos de América	12.729	Silverbrook Research Pty Ltd	199	Silverbrook Kia	167	A61K	5.892	2011	1.008
PCT	4.693	ZymoGenetics, Inc.	150	Walmsley Simon Robert	124	G06F	4.812	2012	1.049
Australia	1.658	BOARD OF REGENTS, THE UNIVERSITY OF TEXAS SYSTEM	146	Menninger Anthony Frank	67	A61P	2.499	2013	1.085
Oficina Europea de Patentes (OEP)	1.554			Andre David	62	G06Q	2.311	2014	1.222
Canadá	1.548	International Business Machines Corporation	137	Charles Howard Cella	62	C07K	2.224	2015	1.098
Reino Unido	209	Board of Regents, The University of Texas System	121	Stivorac John M.	62	C12N	2.138	2016	1.194
Israel	122			Teller Eric	62	G01N	1.539	2017	1.097
Nueva Zelanda	109	ZYMOGENETICS, INC.	98	Rhoads Geoffrey B.	60	H04L	1.506	2018	1.177
Sudáfrica	65	ACCENTURE LLP	97	Sheer Victor H.	58	C12Q	1.430	2019	1.288
China	4	Digimarc Corporation	97	Soroca Adam	58	A61B	1.253	2020	312
		THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	94						
		Accenture LLP	76						

Figure 17. Search Result of Equation 4 and 5 - PatentScope

7.4.3 Search Result in PATENT LENS Database. A review of patents related to the subject of study is carried out, obtaining the following result (See Table 5) according to the respective search equations:

N°	SEARCH EQUATIONS	PATENT LENS
1	(life project) AND (educational technology) NOT (medicine) NOT (healthy) NOT (chemistry) NOT (pharmacology) NOT (physics) OR (Students) OR (Teaching) OR (Education) OR (Internet) OR (Engineering Education) OR (Technology) OR (Learning) OR (Higher Education) OR (Computer Science) OR (Education Computing) OR (Educational Technology)	2.633
2	(life project) AND (educational technology) NOT (medicine) NOT (healthy) NOT (chemistry) NOT (pharmacology) NOT (physics)	2.633
3	(life project) OR ((introspective reflection) AND ((educational technology) AND (design thinking)))	347
4	(life cycle) AND (design thinking	49
5	(life project) AND (educational technology)	30.064

Table 5. Search Results in PATENT LENS Databases

7.4.3.1 Search Equation 1 and Search Equation 2. 2,633 results were found where it is evident that 1022 patents were granted, the country with the most publications made according to equation 1 is the United States of America, having the year 2019 with the most publications executed (See Figure 18), when developing the search with equation 2 the result was equal to that given in equation 1.

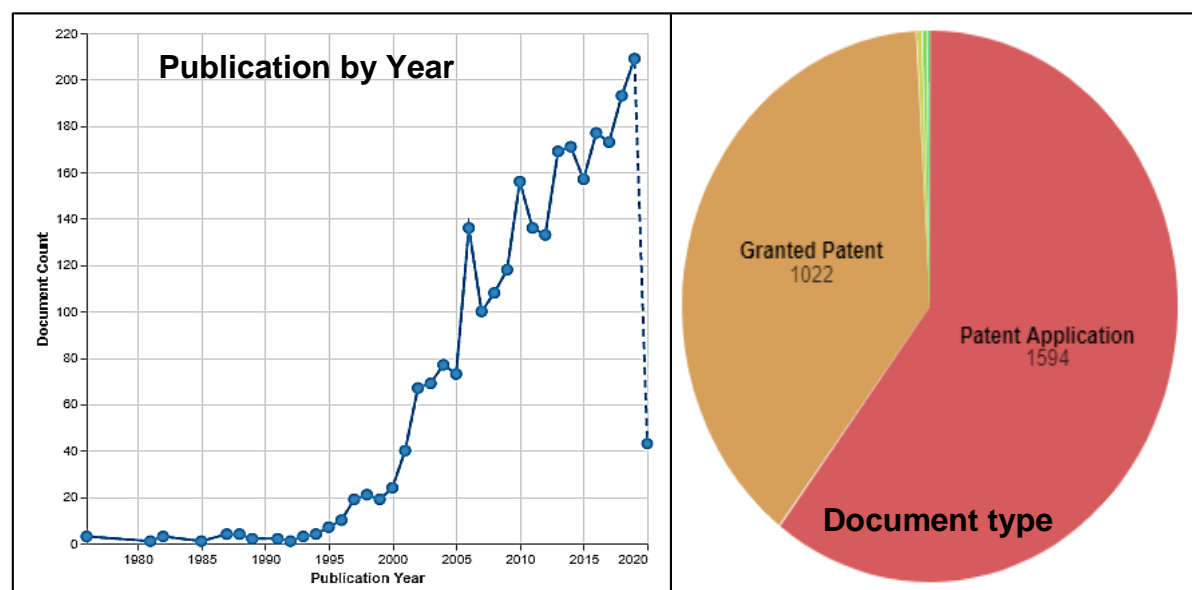


Figure 18. Search Result of Equation 1 and 2 - Patent Lens

7.4.3.2 Search Equation 3. 347 results were found where it is evident that a greater number of patents were granted in 2003, the country with the most publications made according to equation 3 is the United States of America, having the year 2014 with the most publications executed (See Figure 19).

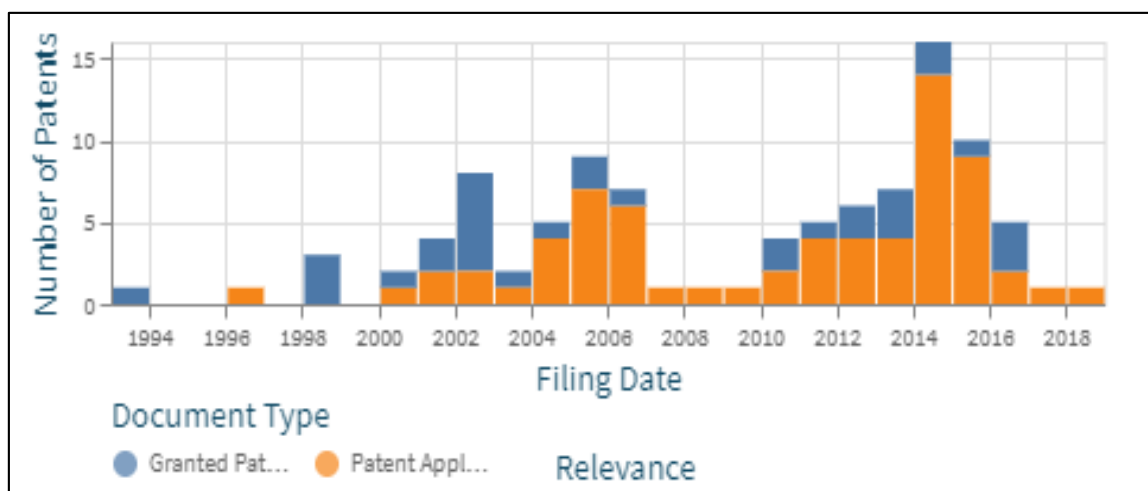


Figure 19. Search Result of Equation 3 - Patent Lens

7.4.3.3 Search Equation 4. 49 results were found where it is evident that the number of patents granted was similar but the year where they were most applied to patents was 2017, the country with the most publications made according to equation 4 is the United States of America, having the year 2014 with the most publications executed (See Figure 20).

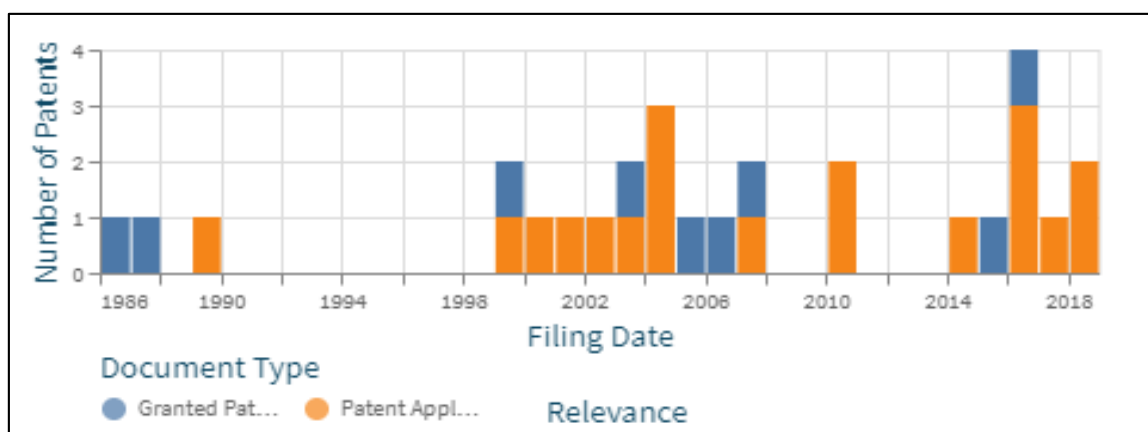


Figure 20. Search Result of Equation 4 - Patent Lens

7.4.3.4 Search Equation 5. 30,064 results were found where it is evident that a greater number of patents were granted in 1999, the country with the most publications made according to equation 5 is the United States of America, having the year 2019 with the most publications executed (See Figure 21).

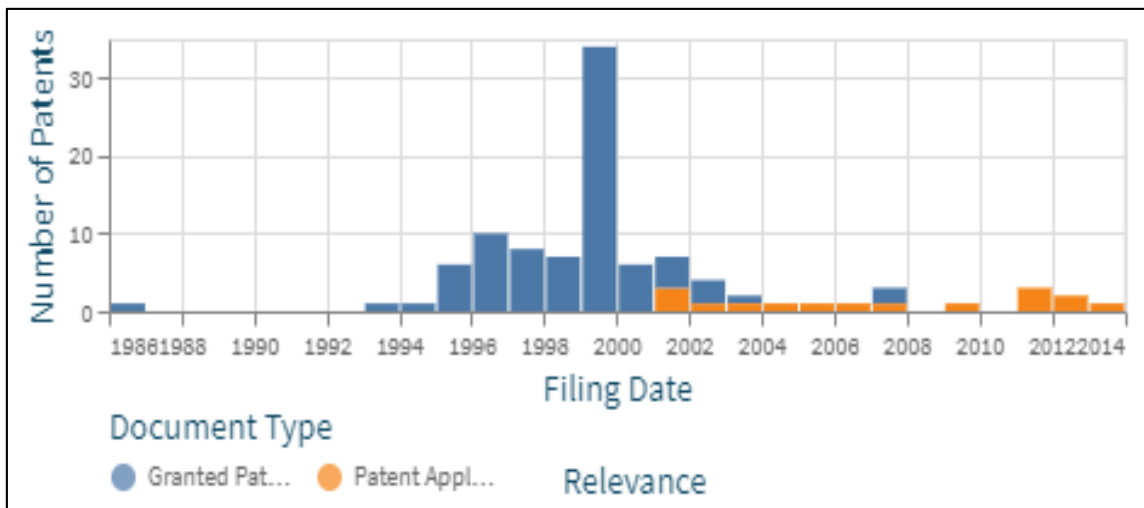


Figure 21. Search Result of Equation 5 - Patent Lens

7.4.4 Search Result in SCOPUS Database. A review of documents related to the subject of study is carried out, obtaining the following result (See Table 6) according to the respective search equations:

N°	SEARCH EQUATIONS	SCOPUS
1	"life project" AND "educational technology" AND NOT medicine AND NOT healthy AND NOT chemistry AND NOT pharmacology AND NOT physics AND (LIMIT-TO (EXACTKEYWORD , "Students") OR LIMIT-TO (EXACTKEYWORD , "Teaching") OR LIMIT-TO (EXACTKEYWORD , "Education") OR LIMIT-TO (EXACTKEYWORD , "Internet") OR LIMIT-TO (EXACTKEYWORD , "Engineering Education") OR LIMIT-TO (EXACTKEYWORD , "Technology") OR LIMIT-TO (EXACTKEYWORD , "Learning") OR LIMIT-TO (EXACTKEYWORD , "Higher Education") OR LIMIT-TO (EXACTKEYWORD , "Computer Science") OR LIMIT-TO (EXACTKEYWORD , "Education Computing") OR LIMIT-TO (EXACTKEYWORD , "Educational Technology"))	183
2	"life project" AND "educational technology" AND NOT medicine AND NOT healthy AND NOT chemistry AND NOT pharmacology AND NOT physics	516
3	"life project" OR "introspective reflection" AND "educational technology" AND "design thinking"	6
4	"life cycle" AND "design thinking"	697
5	"life project" AND "educational technology"	715

Table 6. Search Results in SCOPUS Databases

7.4.4.1 Search Equation 1. 183 results were found where it is evident that the country with the most publications made according to equation 1 is the United States of America, being the year 2014 with the most publications executed (See Figure 22)

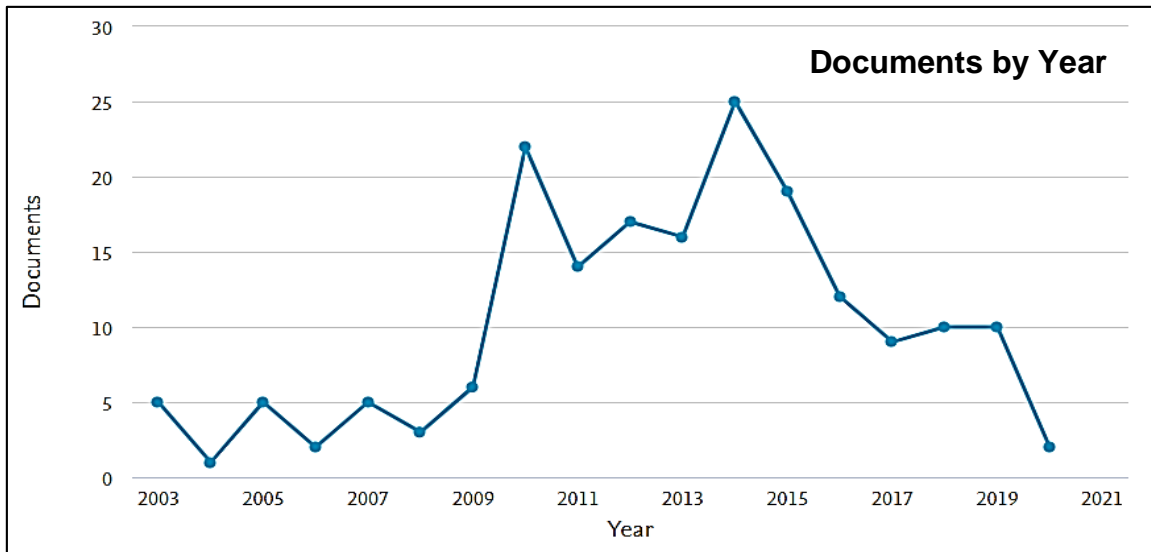


Figure 22. Search Result of Equation 1 (Year)- Scopus

the topic with the highest incidence is the social sciences (34.6%) followed by computer science (31.4%) (See Figure 23).

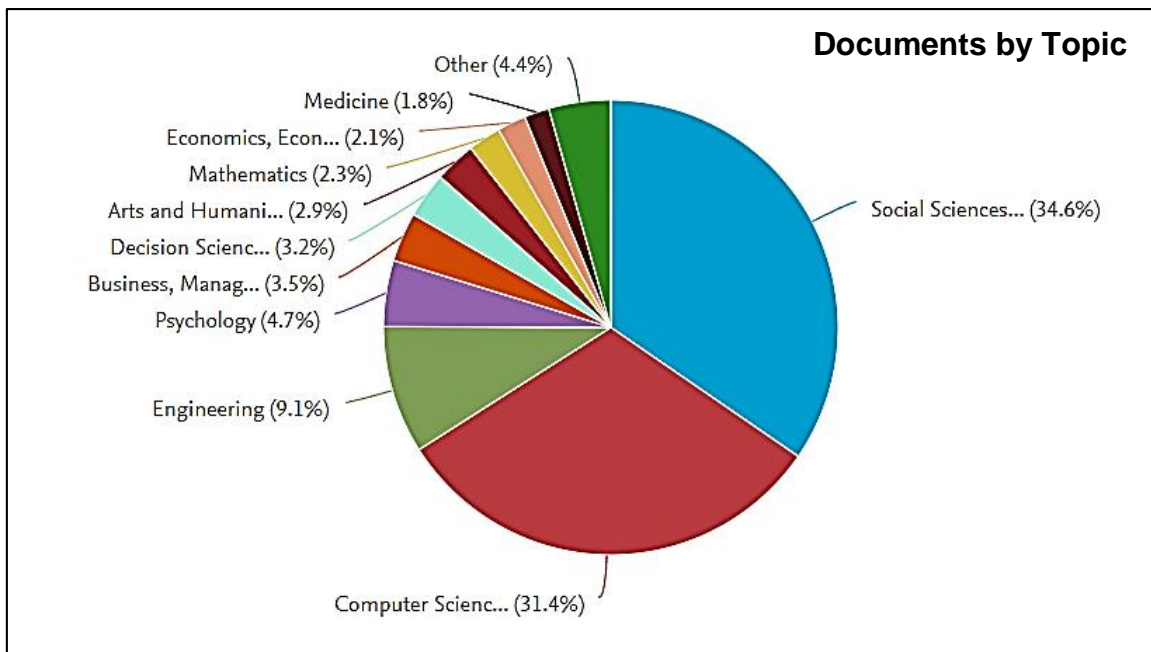


Figure 23. Search Result of Equation 1 (Topic)- Scopus

7.4.4.2 Search Equation 2. 516 results were found where it is evident that the country with the most publications made according to equation 2 is the United States of America, being the year 2014 with the most publications executed and the topic with the highest incidence is the social sciences (43.9%) followed by computer science (24.3%).

7.4.4.3 Search Equation 3. 6 results were found where it is evident that the country with the most publications made according to equation 3 is the United States of America, being the year 2011 with the most publications executed and the topic with the highest incidence is the social sciences (57.1%) followed by computer science (42.9%).

7.4.4.4 Search Equation 4. 697 results were found where it is evident that the country with the most publications made according to equation 4 is the United States of America, being the year 2019 with the most publications executed and the topic with the highest incidence is engineering (22.1%) followed by the business management (14.8%) (See Figure 24).

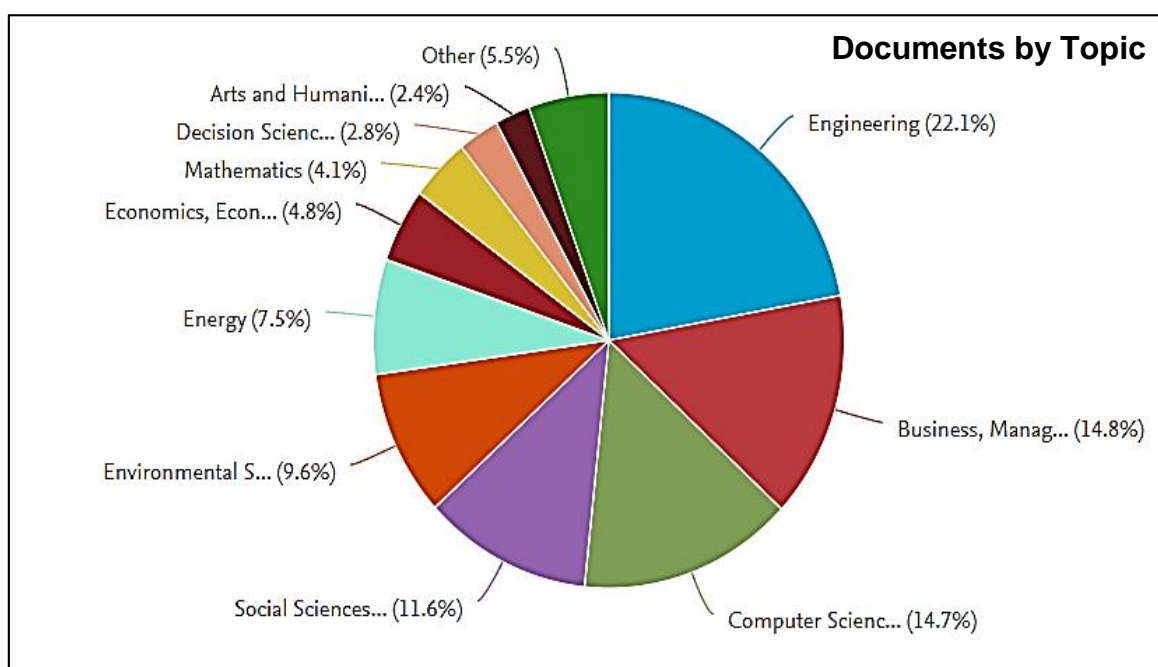


Figure 24. Search Result of Equation 4 (Topic)- Scopus

7.4.4.5 Search Equation 5. 715 results were found where it is evident that the country with the most publications made according to equation 5 is the United States of America, being the year 2014 with the most publications executed and the topic with the highest incidence is the social sciences (41.9%) followed computer science (23.7%).

7.4.5 Search Result in SCIELO Database. A review of documents related to the subject of study is carried out, obtaining the following result (See Table 7) according to the respective search equations:

N°	SEARCH EQUATIONS	SCIELO
1	(life project) AND (educational technology) AND NOT((medicine) AND NOT (healthy) AND NOT (chemistry) AND NOT (pharmacology) AND NOT (physics)) OR ((students) OR (Teaching) OR (Education) OR (internet) OR (Engineering Education) OR (Technology) OR (learning) OR (Higher Education) OR (computer science) OR (Education Computing) OR (educational technology))	5
2	(((((life project) AND (educational technology)) AND NOT (medicine)) AND NOT (healthy)) AND NOT (chemistry)) AND NOT (pharmacology)) AND NOT (physics)	10
3	(life project) or (introspective reflection) and (educational technology) and (design thinking)	N/A
4	(life cycle) and (design thinking)	N/A
5	(life project) AND (educational technology)	11

Table 7. Search Results in SCIELO Databases

A Latin database is selected to obtain closer searches and better matches, according to search **Equations 1, 2 and 5** the articles found are minimal according to the topic while in the search for **Equation 3** (life project) or (introspective reflection) and (educational technology) and (design thinking) and search **Equation 4** (life cycle) and (design thinking), no results were found in the SCIELO database, because writing the equation combined with the word (design thinking) does not locate results.

7.5 MOST IMPORTANT AND RELEVANT DOCUMENTS FOR TECHNOLOGICAL SURVEILLANCE AND COMPETITIVE INTELLIGENCE.

For the purpose of the Technological Surveillance and Competitive Intelligence, 2 patents and 3 scientific documents were used as a reference by means of which it was possible to approach the project and thus observe and learn from the experience of other research, including the first article Higher Education in student life projects in Arequipa, Peru which aims to understand how the life projects of young and adult students are built, For this, a focus group with students was used, interviews directed to directors and documentary records of six state schools where it is concluded that it is necessary to improve the processes of educational orientation through a model that combines vision, mission, foresight and action, being the core the individual and social life project of these students [44]

Likewise, the second document has the development of the reflexivity scale of the life project, a questionnaire constructed for use with Italian students to evaluate the development of reflexivity; this instrument was administered to 502 Italian university students, concluding that the evidence supports the reliability and reflexivity of people regarding their future career, life and personal projects [19]

The last document is the incidence of the pedagogical model in the construction of the life project of students in rural secondary education through which it was concluded that the teaching and learning processes are manifested as disjointed practices of the adopted pedagogical model, due to the autonomy that prevails in the teachers, with respect to the form of their teaching strategies, in the same way, there is no articulation of the interests of the students with the purposes of a specific pedagogical model, as a pedagogical strategy to articulate the interests of middle school students with the teaching and learning processes and the pedagogical model, a didactic unit was designed. [2]

Finally, there are the two patents which are used as a model for the project carried out. The first is a Project-Based Educational System, which refers particularly to a project-based educational system where a structured program is provided to allow students to learn while that at the same time produce commercial products; [10] as a second patent is a project management system for education which provides an internet-based system for monitoring and managing educational projects in which students from an educational institution are assigned one or more projects, projects must be planned and students must submit the information for review and / or approval by participating teachers or others. [36]

7.6 ANALYSIS OF THE OBTAINED RESULTS.

According to the review of the documents and patents related to the study topic, the following results were obtained:

- It is evident that 100% of the works related to patents and articles on the subject are generated in the United States of America.
- The topic of study on articles has increased from 2010 to 2014, however, an important negative trend is evident from 2015 onwards.
- The topic of study has increased its patents since 2006, however, an important positive trend is evident between 2015 and 2019.
- Taking into account the respective search equation of each of the sources, it yielded the following results (See Table 8)

N	SEARCH EQUATIONS	PATENT-SCOPE	PATENT LENS	SCOPUS	SCIELO
1	(life project) AND (educational technology) NOT (medicine) NOT (healthy) NOT (chemistry) NOT (pharmacology) NOT (physics) OR (Students) OR (Teaching) OR (Education) OR (Internet) OR (Engineering Education) OR (Technology) OR (Learning) OR (Higher Education) OR (Computer Science) OR (Education Computing) OR (Educational Technology)	1.879	2.633	183	5
2	(life project) AND (educational technology) AND NOT medicine AND NOT healthy AND NOT chemistry AND NOT pharmacology AND NOT physics	1.879	2.633	516	10
3	(life project) OR (introspective reflection) AND (educational technology) AND (design thinking)	194	347	6	N/A
4	(life cycle) AND (design thinking)	22.639	49	697	N/A
5	(life project) AND (educational technology)	21.065	30.064	715	11

Table 8. Results of the Review of Documents and Patents Related to the Subject of Study

- The main inventors who are continuously patenting are (See Figure 25)

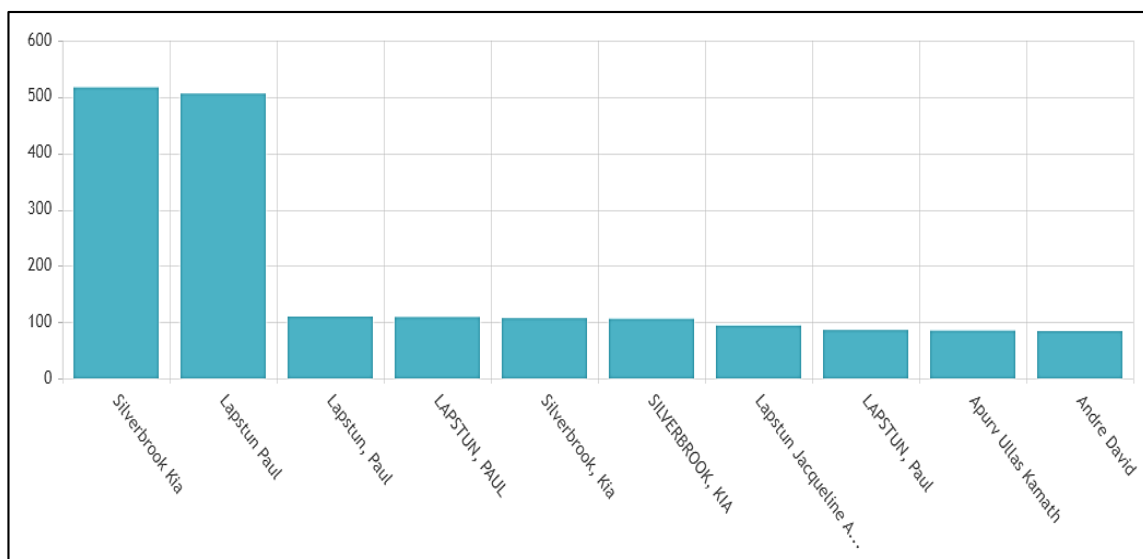


Figure 25. Patent Inventors

- The most relevant authors who are continuously publishing articles on the subject of study are (See Figure 26)

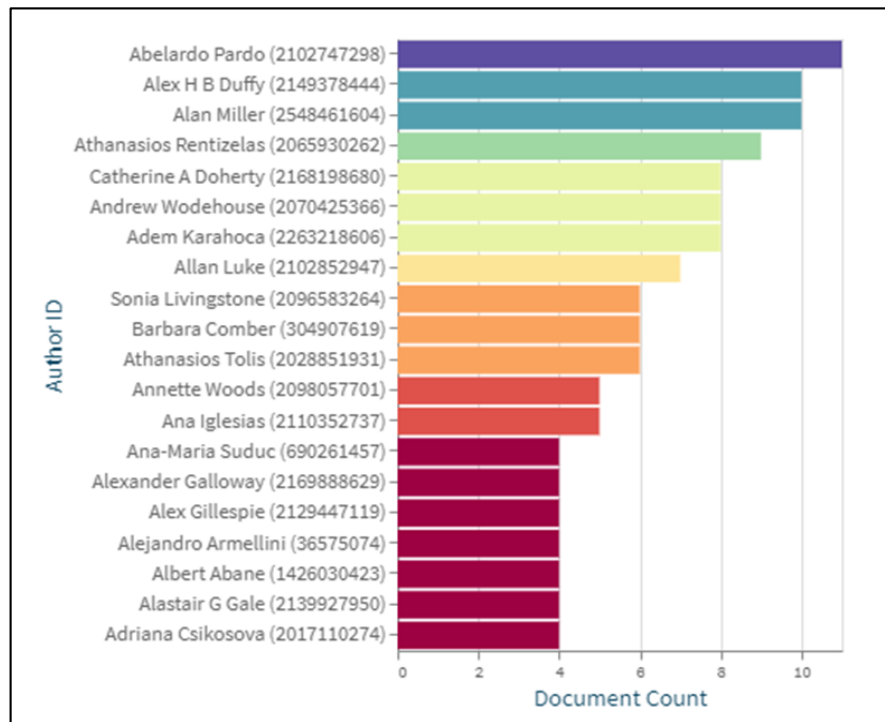


Figure 26. Academic Document Authors

- The main Latin universities that are trending according to the subject of study are (See Figure 27)

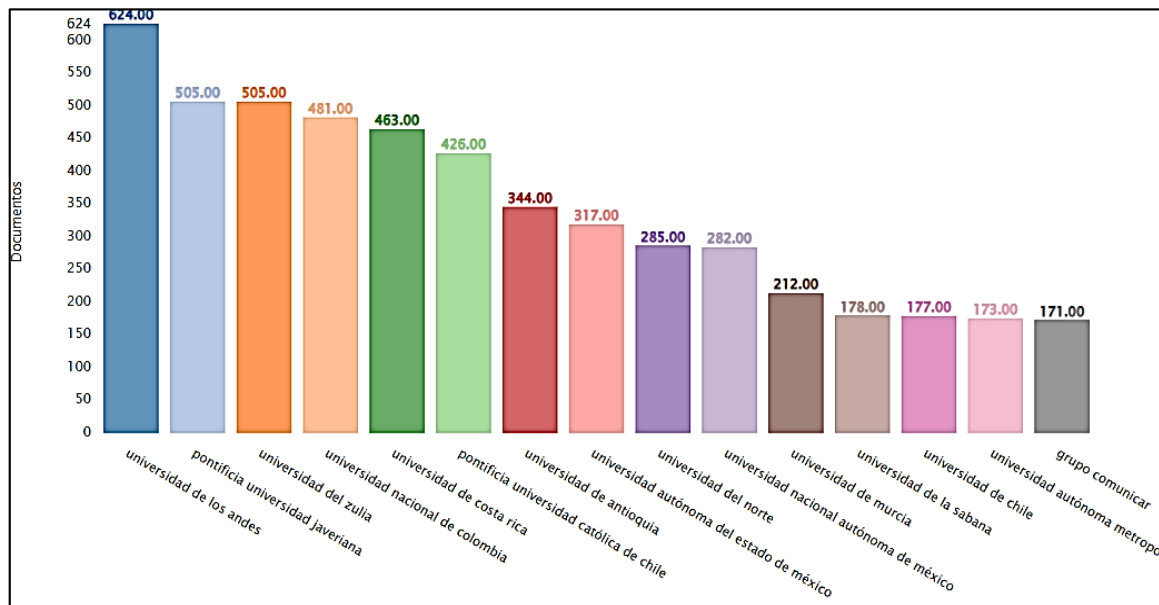


Figure 27. Top Latin Universities with a Trending in the Subject of Study

- Main fields of study (See Figure 28)

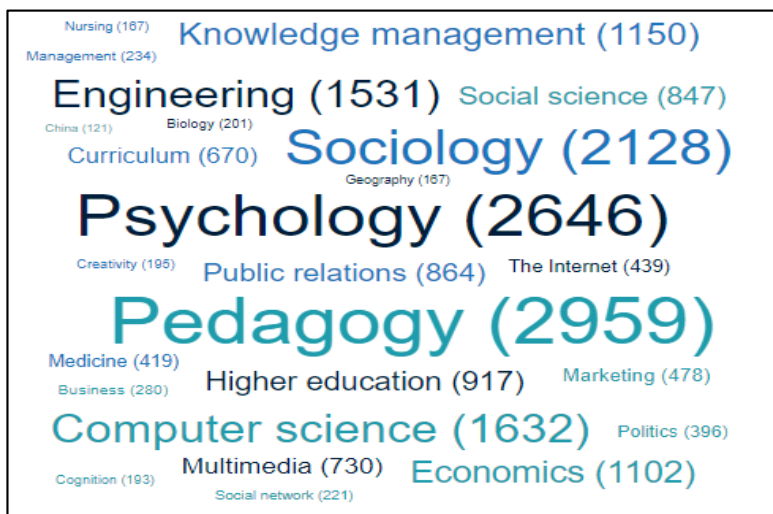


Figure 28. Fields of Study

- Registered patents on the subject of study are mainly associated under the following categories CIP - International Patent Classification (See Table 9)

CIP	DEFINITION
G06Q10/00	Data processing methods or systems specially adapted for administrative, commercial, financial, management, supervisory or forecasting purposes; methods or systems specially adapted for administrative, commercial, financial, managerial, supervisory or forecast purposes, not otherwise provided for (Administration, Management).
G06Q90/00	Systems or methods specially adapted for administrative, commercial, financial, management, supervisory or forecasting purposes that do not involve significant data processing.
G09B1/00	Materials for educational purposes of manual or mechanical control that use elements that form or carry symbols, signs, images or the like, that are arranged or adapted to be placed according to one or more particular schemes.
G09B7/02	Electrically controlled teaching devices or devices that proceed by question and answer of the type in which the student must give an answer to the question asked or in which the machine gives an answer to the question asked by the student.
G09B19/10	Teaching not covered by other major groups in this subclass, Modeling.
G09B19/24	Teaching not covered by other major groups in this subclass, Use of tools.

Table 9. International Patent Classification CIP associated with the subject of study

- The main universities worldwide that are trending according to the subject of study are (See Figure 29)

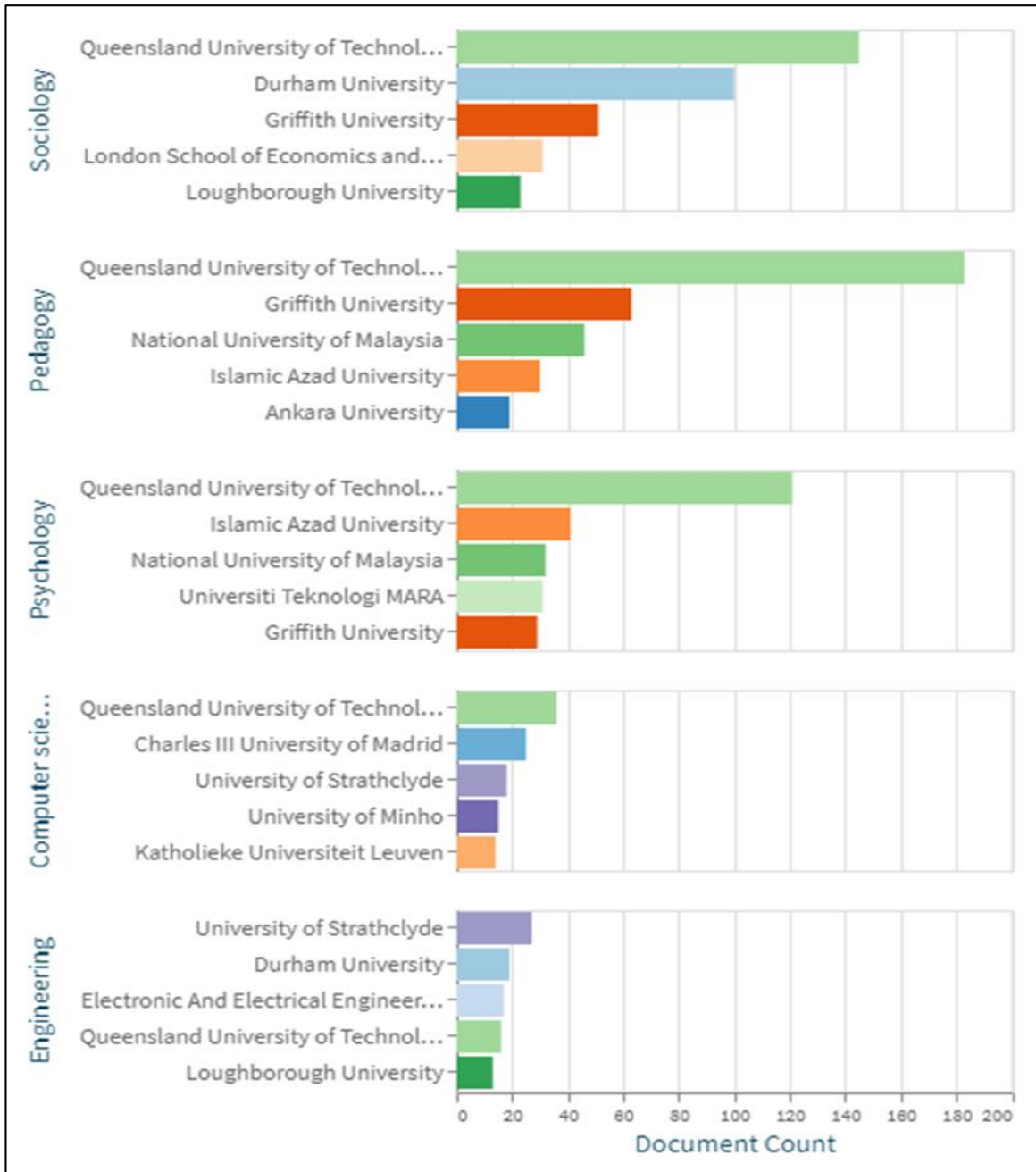


Figure 29. Top Worldwide Universities with a Trending in the Subject of Study

- For future iterations of technological surveillance on the subject of study, the patents generated on said subject should be studied in greater depth, since it has an increase over time and has a high amount of useful information for the project.

8. METHODOLOGY

The development of this research will be made through a mix between the quantitative (based on methods of data collection, statistical and phenomena measures with a deductive, probative and sequential process) and the qualitative approach (stand on the depth of ideas, interpretative richness conducted basically in natural environments, data is extracted without taking into account statistics, with an inductive and recurrent process). [25]

For the execution of the project it will be used a methodology that helps to solve problems by reducing risks and increasing the chances of success, called Design Thinking, as it focuses on human needs and from there it observes, creates prototypes and tests them, and manages to connect knowledge from several disciplines to find a desirable, viable and profitable solution out. This is a methodology made for the resolution of problems where it is used integral intelligence (union of the different intelligences that a man should have to get a full and balanced development), emotional intelligence (way of interacting with the world, it takes into account feelings and includes skills such as impulses control, self-awareness, motivation, perseverance, empathy) and experimental intelligence (learning capability by trial and error; involves observation, manipulation and recording of variables). Design thinking mixes 50% of activities performed for the left hemisphere (rational, logical and linear activities) and 50% for the right hemisphere (tasks and processes which define each one as a creative, imaginative and intuitive person) (See Figure 30), linking in this way the creative thinking with analytical one, which does not prioritize one method over the other but mixes the positive aspects of both. [39]

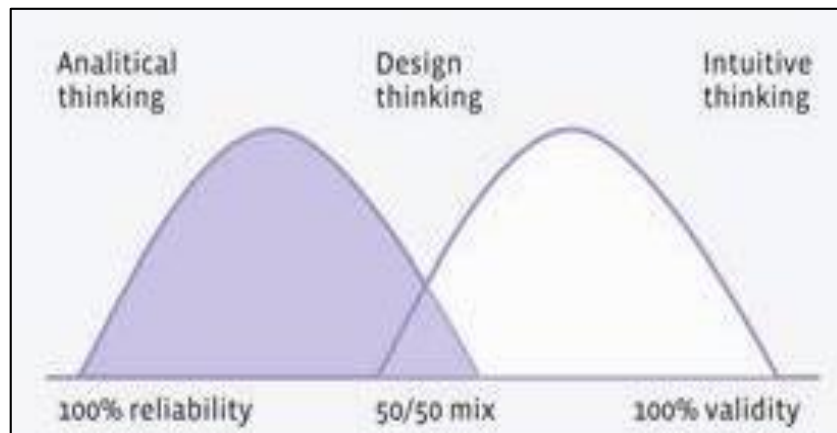


Figure 30. Design Thinking. [39]

Design Thinking process is not a linear process as it is usually the business process (See Figure 31), Tim Brown points out that it must go through three stages: Inspiration (observation of reality in the field), ideation (where ideas that could lead

to solutions are generated, developed and tested) and implementation (how the project is executed, communication strategies are generated and improvements are sought).

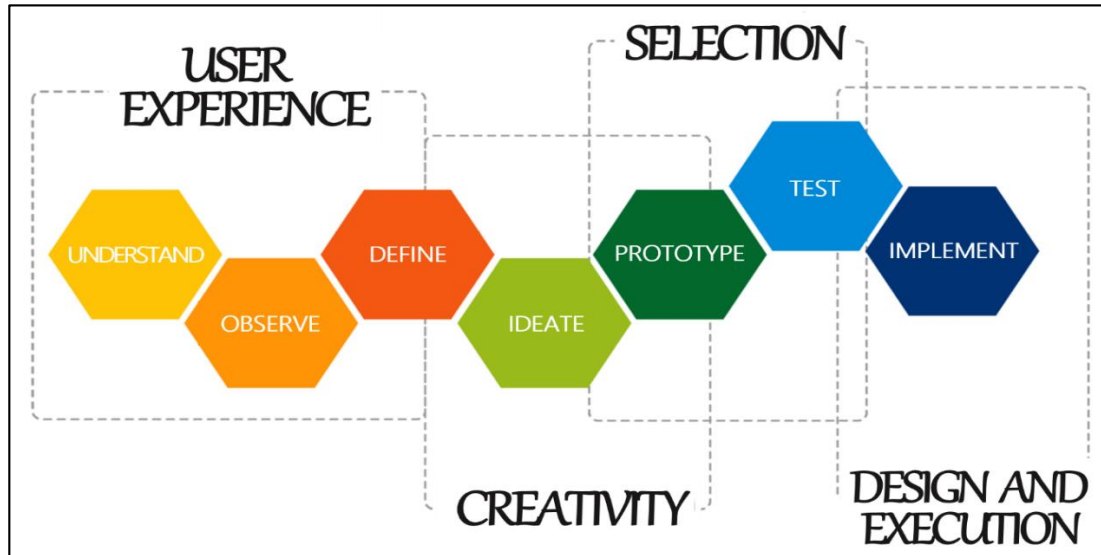


Figure 31. Design Thinking Process applied to a company. [39]

The phases of this methodology are based on the process used by Stanford University (See Table 10).

PHASES	DEFINITION
UNDERSTAND	It's necessary to define and analyze the problem as best as possible, by asking questions to yourself. It's about understanding in depth what people (whom you want to bring the innovative idea) do. The main thing is to spend time with real people and pay attention to them, in order to create the right team that must be multidisciplinary to provide solutions from all perspectives. The objective is to solve it in a positive way, which provides an exceptional value for the client. In this phase we should have more questions than answers. [39]
OBSERVE + EMPATIZE	Empathize with the users and their environment based on their observation as well as the circumstances surrounding the product. Human needs are the starting point. You have to observe what the consumer does and not what he says. Empathy is a central concept in design thinking. It's essential to take the necessary time to consider many whys and not move towards the solution too soon. We must get connected with our users and know what they are interested in, what they are worried about, what they are passionate about. [39]

Table 10. Design Thinking Phases

PHASES	DEFINITION
DEFINE	It leads to consider all possible alternatives to solve the problem. It is about visualizing the future, what comes and not what already exists. The problem is defined and structured in this phase in order to clarify and focus the challenge that has been raised. [39]
IDEATE	It generates a large number of possible solutions to the project, it must remain focused on the problem to be solved, but it should not be judged early. It is necessary to express the thought with visual tools such as photos, sketches, diagrams, etc., to clarify concepts. The brainstorming is a way to generate a lot of ideas that we would not be able to do individually, taking advantage of the group's collective thinking, listening, and building new ideas rest on the previous ones. [39]
PROTOTYPE	Build the good/service up by making sketches, layouts, models. The faster the ideas become tangible the sooner they can be evaluated, re-defined and in this way select the best one. Experimentation is the main guide of a creative organization and the prototype is the best communication tool of the project. Prototypes are used as a thinking tool because they create the opportunity to discover new ideas at a minimal cost. The goal of the prototype is to shape an idea to learn about its strengths and weaknesses. The central point is to imagine the customer experience. [39]
TEST	Repeat the cycle until getting enough information from the user, drawing on the generated prototype, modifying it, and try it again with more people to improve it until it reaches its final design. This part is fundamental since the changes are made directly on objects that somehow already exist, not on a document or a drawing that cannot be proved in practice. [39]
IMPLEMENT	It consists of choosing the best option with proven fundamentals, doing what is necessary to produce it and implementing it successfully in the place or scenario where the product or service is supposed to be in contact with the users, being this the result of the whole process; helping to know if the solution achieved its goals, and seeing what can be improved and what has been learned during the project. [39]

Table 10. Design Thinking Phases (Continuation)

The business process of Design Thinking (See Table 11) presents a set of methods that, applied to the corporate world, turn out to be powerful alternative tools of innovation, referring to the way of thinking of the designer, who uses an

unconventional type of reasoning in the business world, deductive thinking where the solution does not stem from the problem, rather it fits into it. [45]

IMMERSION	ANALYSIS Y SYNTHESIS	IDEATION	PROTOTYPE
It is the time when the team gets closer to the problem context, from the point of view of the company (the client) till the point of view of the final user. It can be divided into the preliminary stage, that has as objective the rethinking and the initial understanding of the problem; and the “in depth” stage, where the needs and opportunities that will serve as a script for finding solutions are identified.	Analysis of collected information. For that, the insights are organized to provide standards and to create challenges that help in understanding the problem.	Beyond the tools, we must emphasize on establishing a wide range of profiles of people involved in the process of generating ideas. Having different experts helps to broaden the spectrum, enriches and gives greater assertiveness to the solutions.	It is the materialization of an idea, the passage from the abstract to the physical to simulate reality and promote validations. It is a learning instrument respect to two aspects: one, because it is necessary to delve into the details, increasing the levels of fidelity of the solution throughout the process; and two, when interacting with the model created, at different levels of context, the user can evaluate it and provide inputs for its evolution and improvement.

Table 11. Business Process of Design Thinking

9. ENTITIES FUNCTIONAL THAT MAKE UP A VIRTUAL NOTEBOOK

➤ **Results.** Taking into account the Design Thinking methodology, the project is developed considering each of its phases, because it seeks to put aside the known solutions to face problems or challenges with new approaches and formulas that have not been contemplated, the idea is to record a divergent point of view so that the process is more open, collaborative and participatory, so the project begins with the stages of user experience and creativity.

Within the user experience stage, the first part is the Understanding part, which refers to the analysis of the problem, definition, creation of the multidisciplinary team to provide solutions from all perspectives, as a second phase Observe through which a development of workshops is carried out to empathize with users observing what they do and thus know that they are interested, concerned or passionate, as a third phase, the Definition is established, which is developed through workshops with experts where all possible alternatives to solve the problem are considered, it is defined and structured focusing on the solution taking into account the observation made previously with the students, thus ending the first stage.

Starting the creativity stage, a part of the Ideation phase is developed where the first sketches (Mockups) are made with the brainstorming generated by the students during the second interaction, taking advantage of collective thinking.

The implementation of a model of internal workshops that refers to all the students who are part of the university community was used as an instrument, in order to observe and know what are the expectations that these students have for the help to their conformation and development of their life project, understanding how can we help them or what tools can they have to know who they are and the meaning of their life project? and what do you need to make it easier to make and build?, because they are the end users but at the same time the beneficiaries of thinking about their proposal in front of the market.

In September 2019, the first application of the workshops was carried out (See Figure 32) in the subjects of Anthropology and Catholic Culture offered by the “Universidad Católica de Colombia”, with 51 undergraduate students (22 women and 29 men) taking third, seventh and eighth semesters, where a small introduction to the life project was exposed to contextualize the interested parties and give them an overview of what the workshop consisted of and its purpose, to continue with its execution, which took place in three moments.



Figure 32. Photographic Record of the first interaction with the Interested Parties

As a first instance, a map of agents was developed, carried out through a group exercise, where each of the key actors in the process of creation and monitoring in the life project could be debated, their order of importance and how these actors help and contribute to their life project; altogether 9 group interactions were carried out (See Figure 33)

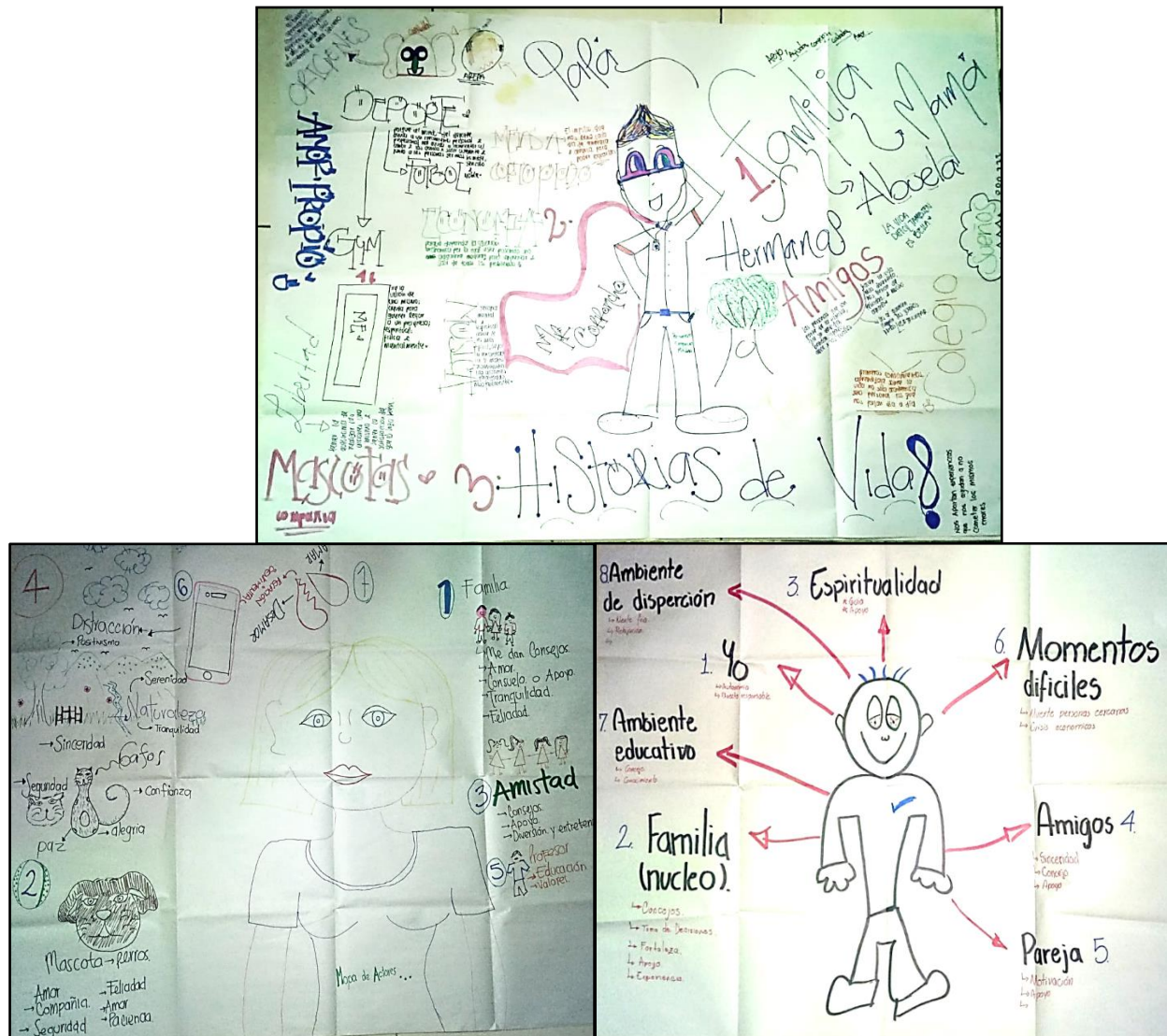


Figure 33. Result Group Interaction with Stakeholders - Map of agents

The first matrix was generated with the results of the map of agents of the key actors in the life project (see Table 12).

	GROUP 1	GROUP 2	GROUP 3	GROUP 4	GROUP 5	GROUP 6	GROUP 7	GROUP 8	GROUP 9
FAMILY	1 Love Comfort Upholder Tranquility Happiness Tips	1 Listens Love Upholder Strength Values Tips	1 Emotional Support Economical support Personal development Moral Identity Spiritual Motivations Relationship building First experiences	1 Respect (mom) Upholder(grandmother) Wisdom (grandmother) Tips (Grandma) Economical support Admiration (Dad)	1 Tips Love Care Upholder Help	2 Strength Upholder Experience Tips Decision making	1 Union Love Social growth Economic growth Family growth Upholder	1 Training and teaching to be a great person in life	
DAUGHTER		2 Love Strength Motivation Listens		2 Self-concepts	2 Self love Feeling Elegance Evil Short-term goals Vision of oneself Sport Music	1 Directly responsible Autonomy		2 Spirituality	
PET	2 Love Happiness companionship Patience Security Peace Joy Trust Sincerity	4 Joy Loyalty companionship Gratitude		companionship	companionship		5 companionship	3 Motivation Peace Love for life	
FRIENDSHIP	3 Entertainment Tips Upholder Fun	5 Stability Fellowship Upholder	3 Experiences Group identity Social interaction Expectations		Fun Happiness Liking Upholder Love See succeed They forge us day by day First knowledge Life learning	4 Tips Upholder Sincerity	4 Loyalty	6 Upholder perseverance	
TEACHERS	5 Education Values						6 Knowledge Teaching Experience		
UNIVERSITY			2 Development Intellectual training Independence	Knowledge		7 Knowledge Tips			
NATURE	4 Positivism Serenity Tranquility								
CELL PHONE	6 Distraction								
LIFE STORIES					3 Experience not to make the same mistakes				
SENTIMENTAL RELATIONSHIP	7 Love					5 Motivation Upholder		5	
FAITH		3 Tranquility hope Trust							
ORIGINS					True love Customs Learnings Knowledge Different perspectives				
POKER		6 Joy Unite friends							
SPIRITUALITY						3 Guide Upholder			
GOD								4 Faith Direction in life	
CONTEXT DISPERSION ENVIRONMENT DIFFICULT MOMENTS ASSERTIVE COMMUNICATION MONEY						8 Relaxation Cold mind Economic crisis Death close people	3 Create needs		
						2 Allows clear and transparent thinking		7	

Table 12. Matrix resulting from the agent map

As a second instance, they brainstormed individually on the possible tools they need to support the development of their life project; In total, 51 individual interactions were carried out (See Figure 34)



Figure 34. Result of Individual interaction with Stakeholders – Brainstorming

The second matrix was generated with the results of the brainstorming of each of the students who carried out the activity; in blue color are the students of the anthropology group and in gray the students of the subject of Catholic culture (See Table 13)

TOOLS	NUMBER OF PEOPLE WHO MATCHED											
	1	2	3	4	5	6	7	8	9	10	11	12
Music												
Tips												
Games												
Health (Medical)												
Reminders												
Helps												
Sports (Exercise)												
Images (Photos)												
Surveys-Test												
Money manager												
Psychology												
books												
Planner												
Videos												
Tips												
News												
Family chat												
Camera												
Questions												
Reflections												
University (Study)												
Support from someone												
Family												
Jurisprudence												
Doubts (social environment)												
Ideas												
Likes and skills												
Law												
Genuine calls												
Bank												
Pets												
Organizer												
Schedule												
Phrases												
Peace with me												
Get motivated												
Tutorships												
Student guide												
Communication												
Activity diary												
Opportunities												
Goals												
Strengths												
Map												
Fun facts												

Table 13. Brainstorming result matrix

TOOLS	NUMBER OF PEOPLE WHO MATCHED											
	1	2	3	4	5	6	7	8	9	10	11	12
Past Learning												
Dreams												
Travels												
Financial support												
To be heard												
Remember Human												
Importance												
Innovation												
Mental health												
Notes												
Memories												
Important documents												
Dictionary												
Security												
Influential people												
Social interaction												
Programming												
Learning												
I												
Business Growth												
Interactive chat with entrepreneurs												
Motivational guide												
Times guide												
Breathing exercises												
Messages												
Bible												
Love												
Activity network												
Podcast												
Meet people												
Couple												
Social networks												
Study subjects												
Subject problem solving												
Plans for bodybuilding												
Life orientation												
Places to practice sport												
College career options												

Table 13. Brainstorming result matrix (Continuation)

In a group way, the individually generated brainstorm is shared and condensed, to collectively design a proposed model of the mobile application (See Figure 35).

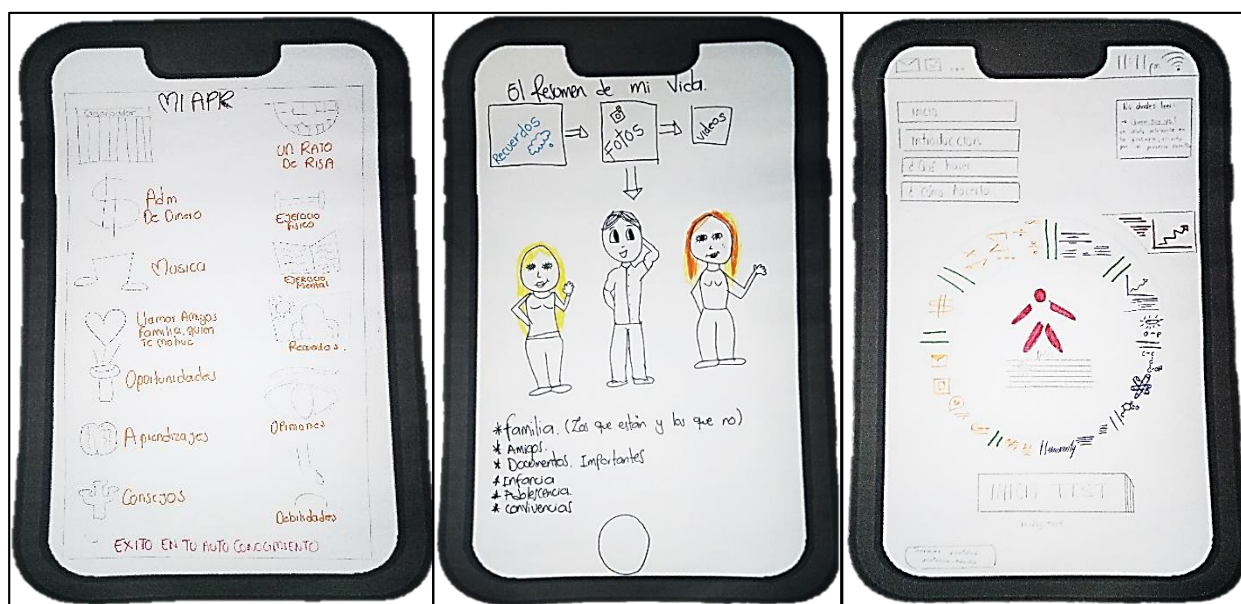


Figure 35. Result of group interaction with Stakeholders-Brainstorming

The conventions of the functionalities guide were made (See Table 14) that show the meaning of each item and the color given for its qualification, this is done in order to validate the prioritization of the functionalities that can be developed and that are more important according to the concept that the students have, about the possible tools that should be had to develop the life project.

CONVENTION	MEANING	
APPLICABLE	YES	The tool can be developed because it contributes to the development of the students and is aimed at the end of the functionality of the App.
	NO	La herramienta no se puede desarrollar debido a que no es necesario, ya existe algo parecido o no va encaminado al fin de las funcionalidades de la App
IMPORTANCE OF THE TOOL	INDISPENSABLE	It is so important that without this tool the application will not work.
	NECESSARY	It is important and must be part of the App.
	INDIFFERENT	It does not matter if it is or not, the application will still work without any problem.

Table 14. Conventions for the guide of the functionalities of the App

The development of the guide to the App's functionalities can be seen in the (Table 15) according to applicability and order of importance.

EXPLANATION	TOOLS	APPLICABLE		IMPORTANCE		
		YES	NO	INDIS.	NECES.	INDIFF.
Related to current mood, inspiring	Music	X				X
	Tips	X		X		
Innovators	Games		X			
Good nutrition	Health (Medical)	X				X
	Reminders	X		X		
Support groups, solving various problems, positive and negative actions, family, teaching values	Helps	X		X		
Physical activity routines	Sports (Exercise)		X			
Inspiring	Images (Photos)					
Remember why you fight		X		X		
That help the future						
See things differently						
Personality	Surveys-Test	X		X		
Professional life						
	Money manager	X		X		
	Psychology	X			X	
Habit of reading	books	X			X	
Short and medium term plans	Planner	X				X
Inspirational	Videos	X		X		
On different topics	Tips	X		X		
News, entrepreneurship, financial	News	X				X
Be in contact with the family	Family chat	X				X
Moment capture	Camera	X			X	
	Questions	X		X		
Help motivate according to reflections	Motivational guide	X		X		
	University (Study)	X				X
	Support from someone	X		X		
	Family	X		X		
	Jurisprudence		X			
information	Doubts (social environment)	X			X	
Diary	Ideas	X		X		
	Likes, skills and strengths	X		X		
Updating of legal issues	Law		X			
	Genuine calls		X			
	Bank		X			
Care and recommendations	Pets		X			
	Organizer		X			
Motivators	Schedule	X				X
	Phrases and messages	X		X		
Spiritual approach, Interact with myself	Peace with me	X		X		

Table 15. Guide to the functionalities of the App

EXPLANATION	TOOLS	APPLICABLE		IMPORTANCE		
		YES	NO	INDIS.	NECES.	INDIFF.
Help with study topics	Tutorships		X			
General knowledge-culture-information To help organize the time I have to carry out my activities	Student guide	X			X	
	Activity diary	X			X	
	Opportunities	X			X	
	Dreams and goals	X		X		
	Map		X			
Block of important notes	Fun facts	X		X		
	Past Learning	X			X	
	friends	X			X	
	Travels	X			X	
	Financial support	X				X
	To be heard	X		X		
	Remember Human	X		X		
	Importance	X		X		
	Innovation	X			X	
	Mental health	X			X	
	Notes	X		X		
	Memories	X			X	
	Important documents		X			
	Dictionary		X			
	Security		X			
Responding to concerns	Influential people	X		X		
	Social interaction	X				X
	Business Growth	X		X		
Ideal times for the youth stages	Interactive chat with entrepreneurs	X			X	
	Times guide	X				X
	Breathing exercises	X			X	
Possible activities that can be carried out in Bogotá or in the U	Bible	X				X
	Love	X		X		
	Activity network (Plans to get cultured)	X			X	
	Podcast	X				X
Common tastes	Meeting people-communication		X			
	Couple	X				X
Through videos of what is being seen in class	Social networks		X			
	Study subjects		X			
	Subject problem solving		X			
	Life orientation	X		X		
	Places to practice sport	X				X
	College career options	X			X	

Table 15. Guide to the functionalities of the App (Continuation)

In October 2019, the second interaction with stakeholders was carried out by applying the workshops (See Figure 36) in a humanities activity offered by the “Universidad Católica de Colombia”, with 47 undergraduate students (16 women and 31 men) taking different humanities subjects and semesters, where a contextualization of the life project was established for those interested and thus give them an overview of what the second workshop consisted of and its end, to continue with its execution.



Figure 36. Photographic Record of the second interaction with the Interested Parties- Humanities

The same previous workshop was held in October 2019 with students from the dance group of the "Universidad Católica de Colombia" (See Figure 37) following the same methodology carried out in the humanities activity with the only difference that it was carried out with students from different semesters and degrees; In order to have a look of students who were in a different environment than the classroom and also carried out an extracurricular activity, this helped to have many more tools and results that helped more effectively in the project, because when developing the workshops they gave many more ideas to improve the different designs.



Figure 37. Photographic Record of the second interaction with the Interested Parties- Dance Group

The second workshop had as an exercise to design some sketches of the current Mockups that had been raised according to the requirements stipulated by the students during the development of the first workshop, therefore, for this second workshop, groups of students were sought to improve the current design and leave their recommendations indicating that they would remove, modify or add to the current design of the Mockups.

As a result of the second interaction with the stakeholders, different proposed Mockups were obtained taking into account the 5 general Mockups that had been presented to the students, then, the image of the current Mockups is evident, followed by the results of the Mockups proposed by the students, taking as the first image those designed by the students with subjects in the humanities, followed by the designs of the members of the university dance group, within the humanities section, it is taken into account that it will contain the 5 subjects taught by this area of the university.

As a first instance was the menu design (See Figure 38) called "Home Page" within this Mockups there are four main icons.

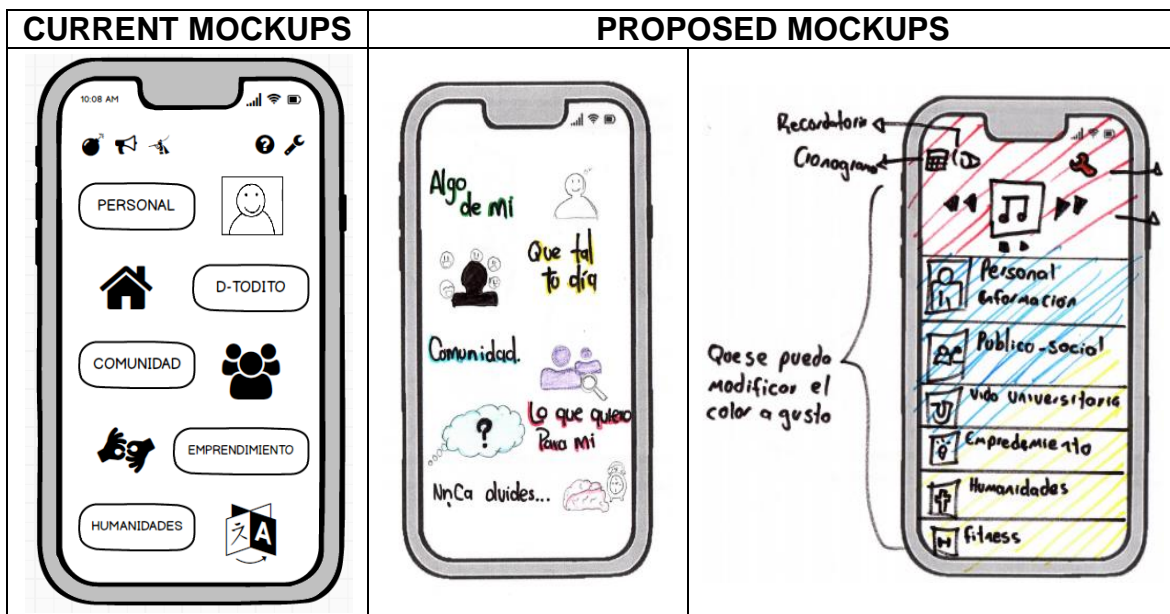


Figure 38. Result of the current and proposed Mockups 1 “Main Page” design workshop of the interaction with the Stakeholders

The first icon found is "Personal" (See Figure 39) in order to have space to talk about yourself and what you want for your future.

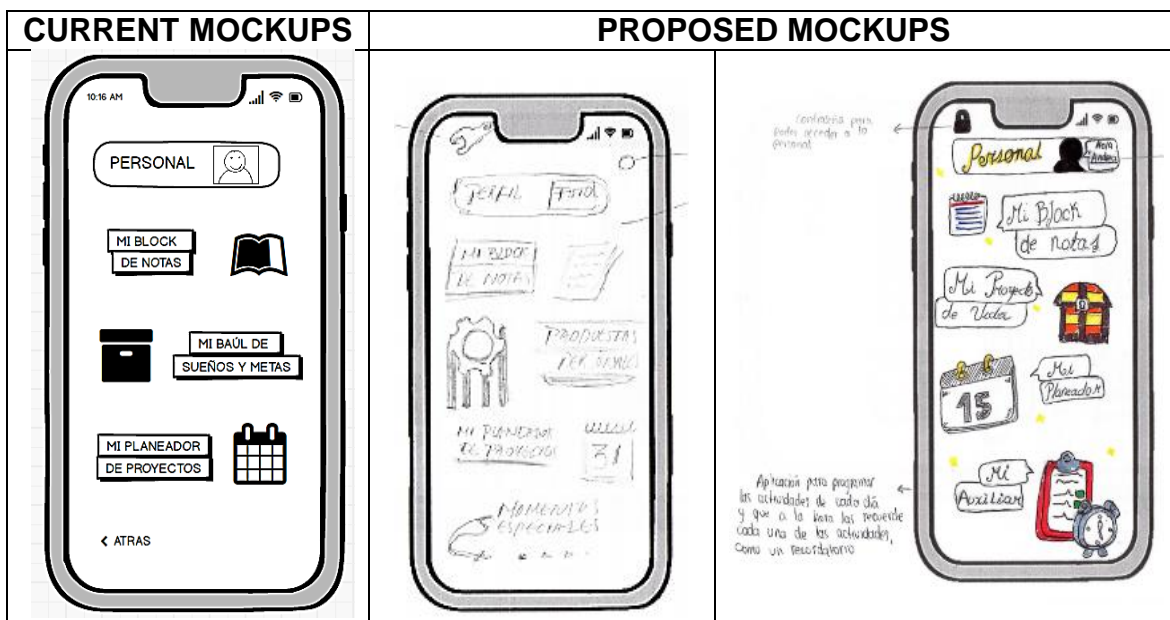


Figure 39. Result of the current and proposed Mockups 2 “Personal” design workshop of the interaction with the Stakeholders

The second icon called "D-Todito" (See Figure 40) which explains to us about human importance and the tools necessary to get to know each other.

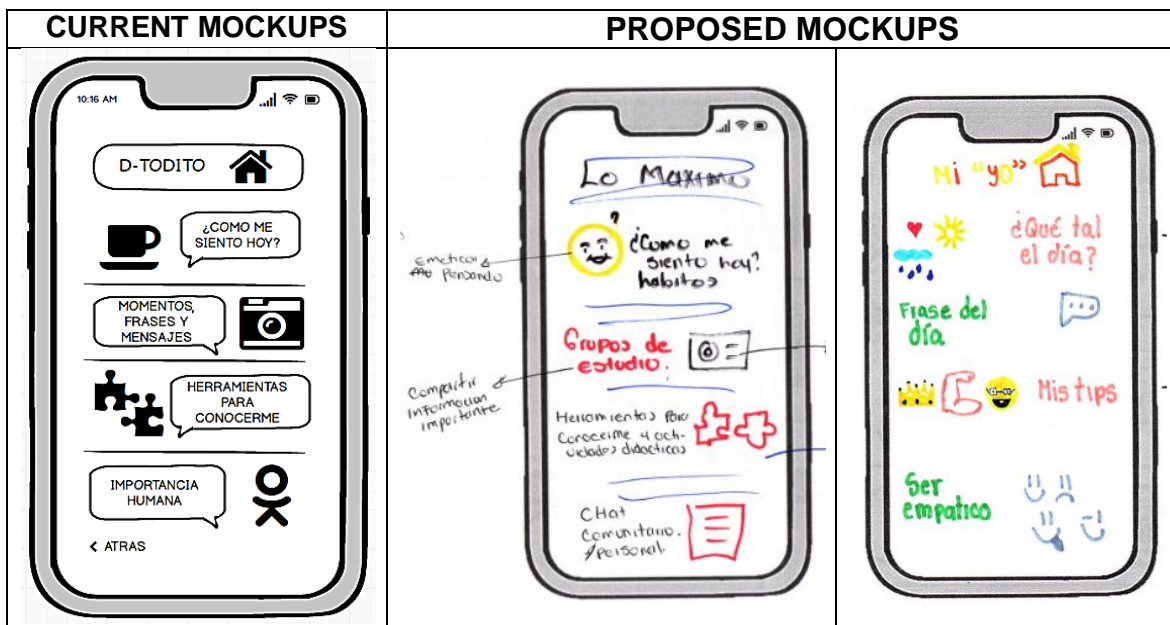


Figure 40. Result of the current and proposed Mockups 3 "D-Todito" design workshop from the interaction with the Stakeholders

The "Community" icon (See Figure 41) in order to generate groups for students to communicate with each other and they can learn about different topics of interest.

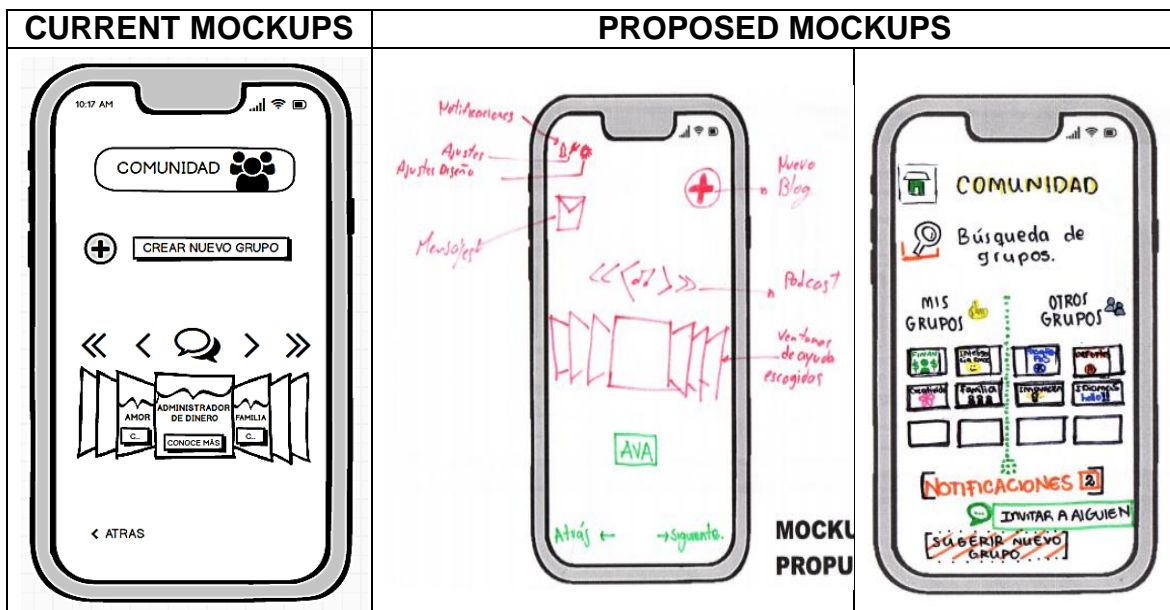


Figure 41. Result of the current and proposed Mockups 4 "Community" design workshop of the interaction with the Stakeholders

To end this the "Entrepreneurship" icon (See Figure 42) with the intention of generating entrepreneurial ideas and projects having contact with experts on the subject to guide them in the process.

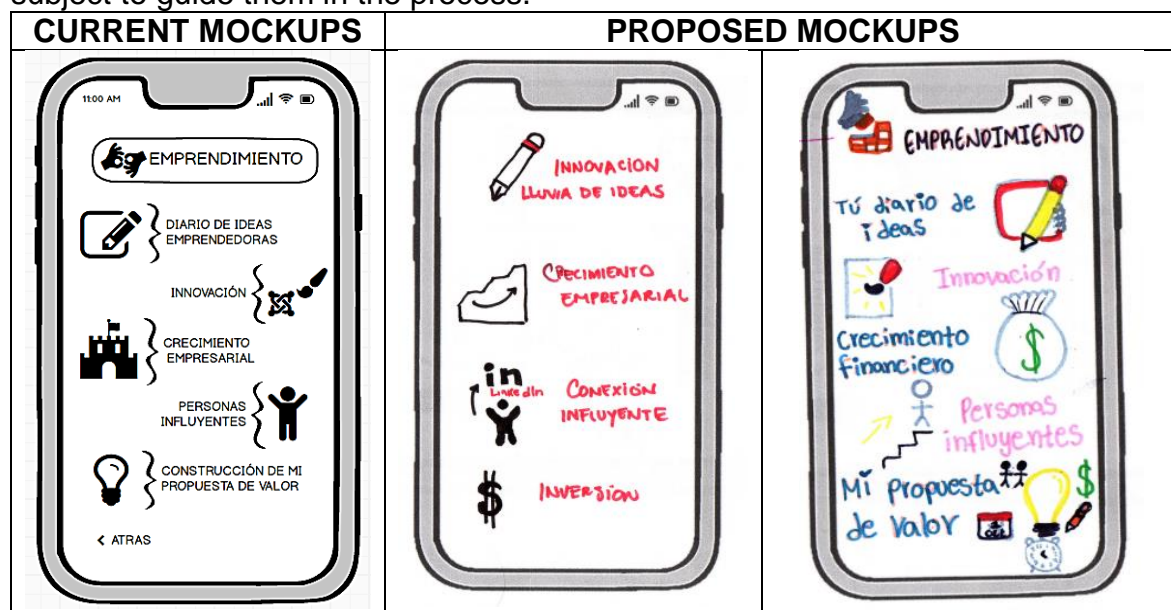


Figure 42. Result of the current and proposed Mockups 5 "Entrepreneurship" design workshop of the interaction with the Stakeholders

On the other hand, within the workshop, a space for brainstorming is developed so that students can propose the name they want for said mobile application, according to which the following options were generated (See Figure 43).

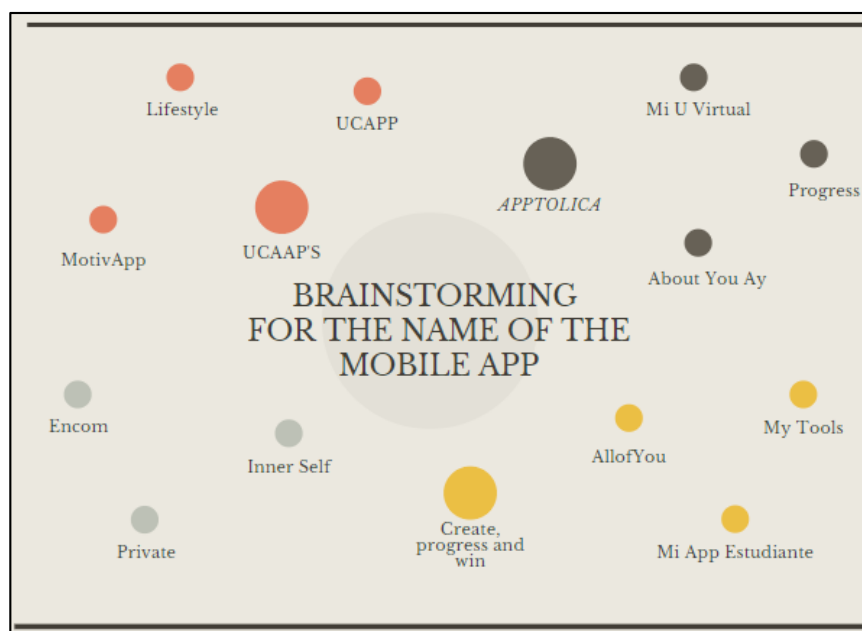


Figure 43. Brainstorming result of interaction with Stakeholders for the name of the mobile application

Finally, a matrix is made with the results obtained from the different designs made by the students (See Table 16), collecting and condensing the information from each of the Mockups with the different recommendations given in terms of form and content.

MOCKUPS 1 "Página Principal"	MOCKUPS 2 "Personal"	MOCKUPS 3 "D-Todito"	MOCKUPS 4 "Comunidad"	MOCKUPS 5 "Emprendimiento"
Personal (Relationship with my environment) Schedule Fitness Music Personal information Public-social College life Personal (Some of me) D-Todito (How was your day) Entrepreneurship (What I want for me) Humanities (Never Forget) Modify color to taste	Name (PROFILE) Name (My Biography) My trips Projects Chat Building new ideas Calendar My emotions Personal proposals Special moments My life project My assistant (schedule the activities of each day and remind) Proper name in the title Password to access personal Custom background White and blue background Setting Help Adjustment	Name (My day) Name (Maximum) Name (All in 1) Name (My Me) Virtual psychologist Habits Study groups (sharing important information) Personal community chat Feelings, emotions HELLO (Group messages) How I feel today? (How about the day?) Moods Phrase of the day My tips (Self-knowledge) Being Empathetic (Recognizing the emotions of others) Didactic activities Blue background Emoticons thinking	Name (U Católica People) New ideas Daily goals Social Slopes Me Help Economy Companions U Goals New Blog Messages Podcast AVA Notifications Group search My groups Other groups Invite someone Suggest new group Adjustments Design adjustments Custom background Selected help windows	Employment exchange Marketing Influential Connection Investment Games Motivation (how the student feels in his day) Check Progress Study techniques Comments and chat Design for the company logo Your journal of ideas Financial growth My value proposition Setting Search Personalize my App Night mode

Table 16. Matrix resulting from the proposed Mockup design workshop

In the month of November 2019, the first interaction was carried out with the experts where the application of a workshop was developed (See Figure 44) with the teachers of the humanity area of the “Universidad Católica de Colombia”, with 23 undergraduate teachers (7 women and 16 men) from different subjects in that area, where a contextualization of the life project was established according to the guidelines of the University, also to give them an overview of what has been done with the students so that in this way they give their contribution to what they have said and thus create the itineraries of the tools suggested by their students.



Figure 44. Photographic record of interaction with experts

The objective of the meeting with the teachers was to organize and develop the respective itineraries of each of the different concepts and tools that the students had previously proposed, in which it is sought to enter to deepen and have a structure on the different lines that each of the main icons would reach and also to know towards which topic or subject each would be directed according to the information captured.

In this meeting the definition established by the "Universidad Católica de Colombia" for the life project is affirmed, understanding that it is: “... *the model in which your aspirations for personal fulfillment are designed*” (MPI, page 21) and it has as reference and reflection “truth, beauty, good and transcendence”, common and predictable aspects of the human condition and its development. The life project

conceived as a model, establishes the set of reflections, conditions-mechanisms and criteria on which the personal, formative and social actions that the educational community advances from the processes or substantive missionary functions in favor of the formation of the person converge.

With the results obtained in the two workshops carried out with the interested parties (Students) and the workshop developed with the experts (Teachers), the final version of the Mockups is generated, taking into account each of the recommendations, suggestions and guidelines given by these groups.

Concluding with the first stage of the user experience and part of the second stage of creativity in Design Thinking, which comprises the phase of understanding, observing, defining and ideation (See Figure 45) a summary of the execution of these four phases is evident during the characterization of the entities functional that make up the prototype.

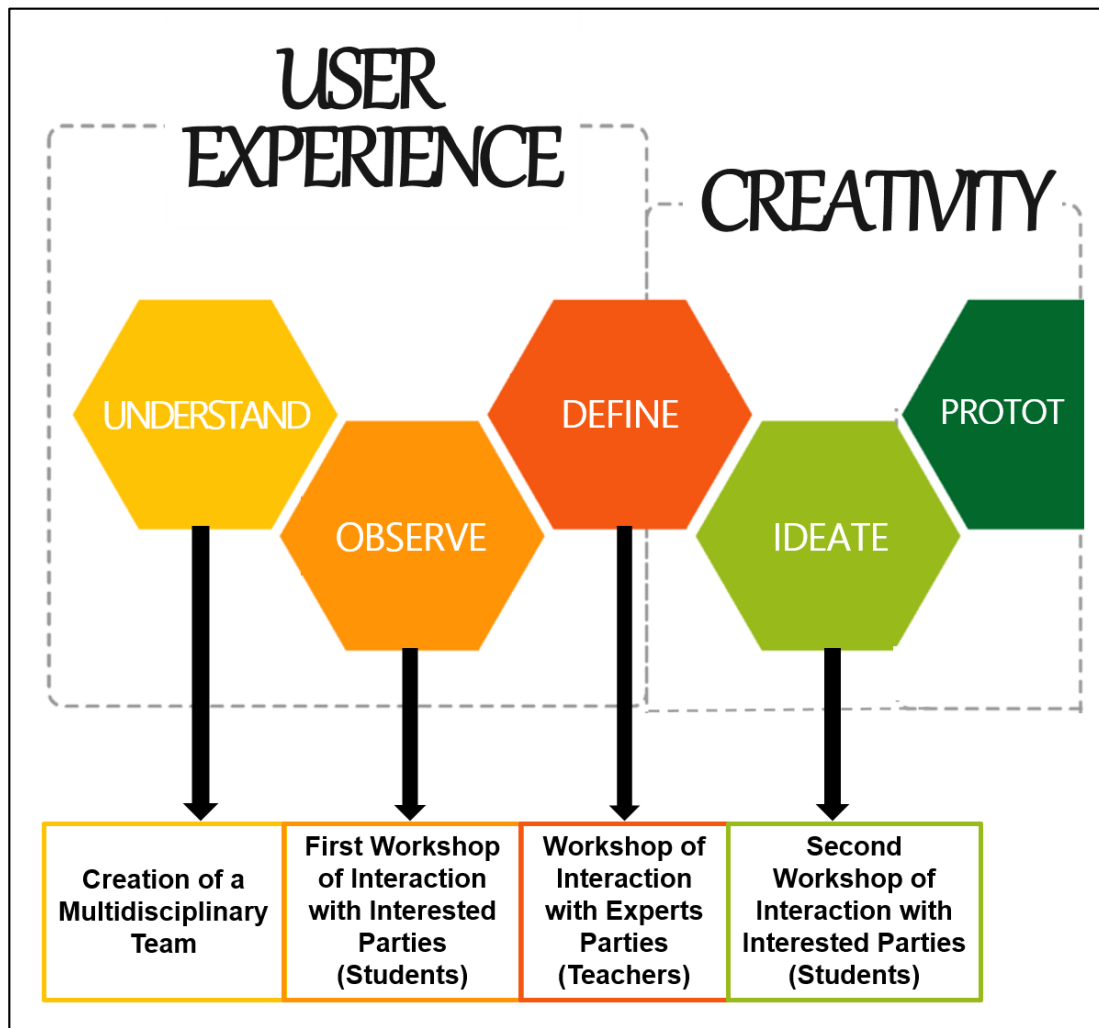


Figure 45. User Experience and Creativity Stage of Design Thinking

10. DESIGN PROTOTYPE

➤ **Results.** At the beginning of the second stage of Design Thinking that refers to user creativity through which the second part of the ideation phase is generated where mockups are developed taking into account the preliminary sketches prepared by the students, from this the fifth phase is carried out, which refers to the prototype through which the functional requirements of the mobile application and the UML diagram design are executed, thus completing the second stage.

Starting the selection stage, the Testing phase is carried out, where the use of the application is developed to determine modifications and improvements until its final design is achieved.

Next, the different Mockups that will be part of the notebook virtual mobile application with their respective explanation are exposed, these designs are developed according to the information captured from interested parties and experts.

A. LOG IN. Log in will be the welcome picture that users will see when entering the mobile application, where they will have the option of creating the account if it is the first time they are entering or logging in to browse if they already have an account created previously (See Figure 46).



Figure 46. Log In Mockups

B. CREATE ACCOUNT. For users entering the mobile application for the first time, they must create their account to access the navigation, for this they must fill in the basic data and create the security password to enter the menu, where the user is the email that they previously registered (See Figure 47).

11:14 AM

< ATRAS

NOMBRES

APELLIDOS

No. DOCUMENTO

ESTADO

EDAD

FECHA DE NACIMIENTO

E-MAIL

CONFIRMACIÓN E-MAIL

CONTRASEÑA

CONFIRMACIÓN CONTRASEÑA

CREAR

Figure 47. Create Account Mockups

C. WELCOME VIDEO. The welcome video will appear for all the people who created the account for the first time, in this video the presentation and contextualization of the application will be shown to explain how it works and what its purpose is (See Figure 48).



Figure 48. Welcome Video Mpckups

D. MENU. Every time you access the application, you will see this menu where you will find the 5 main items of which the tool is composed, each one ordered according to the methodology taught by the humanities for the construction of the life project (See Figure 49).



Figure 49. Menu Mockups

E. ABOUT US?. It corresponds to the first item of the tool, which consists of the bases taught in the “Preseminario” course offered by the university to understand the importance of human education and training, in addition to raising the student's awareness of their commitment to social justice, citizen responsibility and care for the environment, in order to take responsibility for their growth as a person (See Figure 50).



Figure 50. About Us? Mockups

F. MY BIOGRAPHY. The second item of the tool corresponds to the knowledge of Who am I? who teaches the “Antropología” course of the University which seeks to understand the foundations of the philosophy of the person and its characteristics to recognize the human person as the center of the Institutional Mission (See Figure 51).



Figure 51. My Biography Mockups

F1. HOW I FEEL?. It belongs to the first item of the tool, being the initial icon found in “My biography”, which allows using a notepad to write or draw how the user is at that moment, creating a dated list of the different feelings that the person has experienced (See Figure 52).



Figure 52. How I Feel? Mockups

F2. LIFELONG DREAMS, PROJECTS AND GOALS. The second icon of “My biography” consists of narrating different ideas of the dreams that the user has in the future and later turning them into projects that he will divide into several goals (See Figure 53).



Figure 53. Dreams, Projects and Goals Mockups

F3. TOOLS TO KNOW ME. As a third icon of “My biography” there are different tools that the user has to get to know each other, where each one contains a small description and explanation of how the activity is carried out and the space necessary to solve the exercise (See Figure 54).



Figure 54. Tools to Know Me Mockups

F4. MY GLIDER. My glider is part of “My biography” and is the fourth icon, in it we can see a calendar where you can locate the dates or activities, respectively, of the user (See Figure 55).



Figure 55. My Glider Mockups

F5. SPECIAL MOMENTS. It is the fifth icon of “My biography” which consists of saving different images, phrases, songs or files that are of interest to the user, generating a record of the most representative and significant (See Figure 56).



Figure 56. Special Moments Mockups

G. UCATOLICA PEOPLE. For the tool, the third item corresponds to the “Ética” course offered by the University, which seeks the for what? where the natural moral law is understood, its characteristics and implications in the life of the person and the social development and the importance of the moral virtues to reach the personal perfection and the harmony of the life in society (See Figure 57).



Figure 57. UCatolica People Mockups

G1. VIRTUAL PSYCHOLOGIST. The virtual psychologist is the second icon of “UCatolica People” through which to seek to obtain an application for counseling that offers student permanence, aimed at students at risk of academic loss and desertion due to events related to personal situations (See Figure 58).



Figure 58. Virtual Psychologist Mockups

G2. VOLUNTEERING. It is the third icon of “UCatolica People” to seek to show the options that the institution has to carry out different volunteer activities and help the community, as well as spiritual activities for personal growth (See Figure 59).



Figure 59. Volunteering Mockups

G3. TRAVELS. It is part of the item of “UCatolica People” where they seek to give recommendations of the different places that the user will be able to know, as well as the things that they need to go to those places, where you can see comments from people who have already had the experience (See Figure 60).



Figure 60. Travels Mockups

H. SPIRITUALITY. As a fourth item is spirituality where it is related to the “Cultura Católica” course taught by the university where transcendence is focused, which seeks that the student acquires the intellectual conditions that allow him to identify the characteristic features of faith as a form of knowledge, understand what being, mission and the reason why the “Universidad Católica de Colombia” considers that staying true to its teachings is one of its essential principles (See Figure 61).



Figure 61. Spirituality Mockups

I. CREATIVITY-ENTREPRENEURSHIP. As a last item is entrepreneurship, which is related to the subject of “Filosofía del Arte” offered by the university where harmony is sought in order to reflect on the human being as a perfectible work based on aesthetic appreciation and creation of works through aesthetic experience and beauty (See Figure 62).



Figure 62. Creativity-Entrepreneurship Mockups

I1. ENTREPRENEURIAL IDEAS BINNACLE. It belongs to the last item of the tool being the first icon found in “Creativity-Entrepreneurship”, which allows using a notepad to write or draw entrepreneurship ideas that the user reflects at the time, creating a dated list of the different thoughts that has had the user (See Figure 63).



Figure 63. Entrepreneurial Ideas Binnacle Mockups

I2. WELFARE UNIVERSITY. It is part of “Creativity-Entrepreneurship” where it seeks to provide information on groups of culture, sport and human formation, as well as the area of promotion of university health, in addition to publicizing the semester schedule of Welfare University (See Figure 64).



Figure 64. Welfare University Mockups

I3. UCATOLICA EMPLOYMENT EXCHANGE. It corresponds to the last “Creativity-Entrepreneurship” icon that transfers to the virtual platform of exclusive job offers for final semester students and university graduates to start in the job market (See Figure 65).



Figure 65. UCatolica Employment Exchange Mockups

Taking into account the previous development, the functional requirements of the mobile application are identified (See Annex A) describing any activity you must perform, behaviour, reaction, or function to particular system inputs, including functions performed by specific screens, descriptions of the workflows to be performed by the system and other business requirements, from this the development with the Unified Modelling Language-UML diagramming tool begins they are graphic representations that partially show an information system, executed to aid in the development and modelling of a system or software product to describe, design, specify, visualize, build and document all the artefacts that compose it, made in order to pre-design an application before proceeding with its development and implementation.

In this way the elaboration of the diagrams in UML begins with developing a tree diagram (See Figure 66) with in relation to the Mockups mentioned above, where the respective order and position of said designs is located to see the organized structure of the beginning and end of each one and the achievement of the same in order to be clear about the different routes that each Mockups.

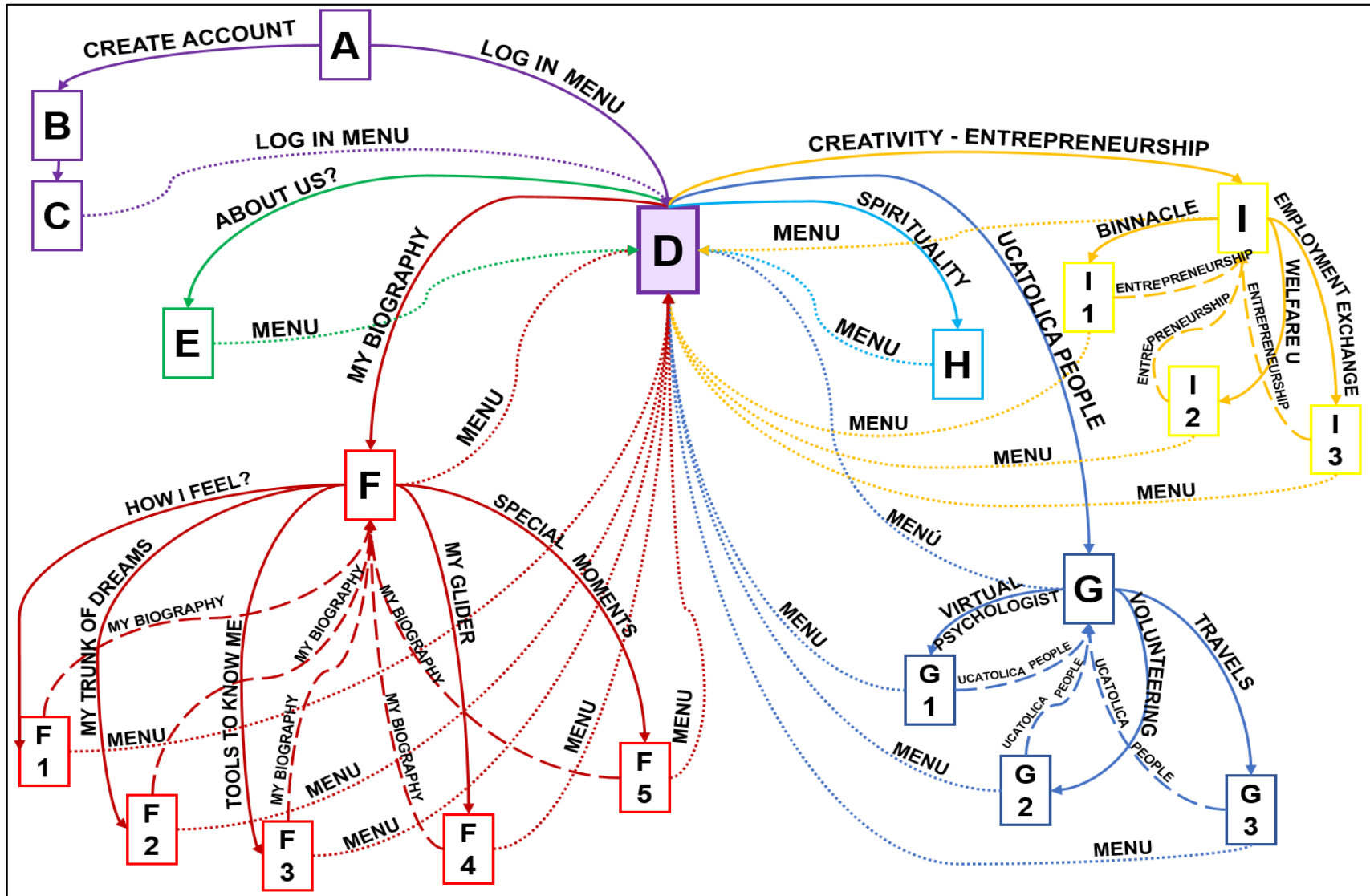


Figure 66. Mockups Tree Diagram

The deployment diagram is developed (See Figure 67) to model the physical position of the hardware platform artifacts, showing the system architecture as the distribution of the software artifacts to the deployment targets.

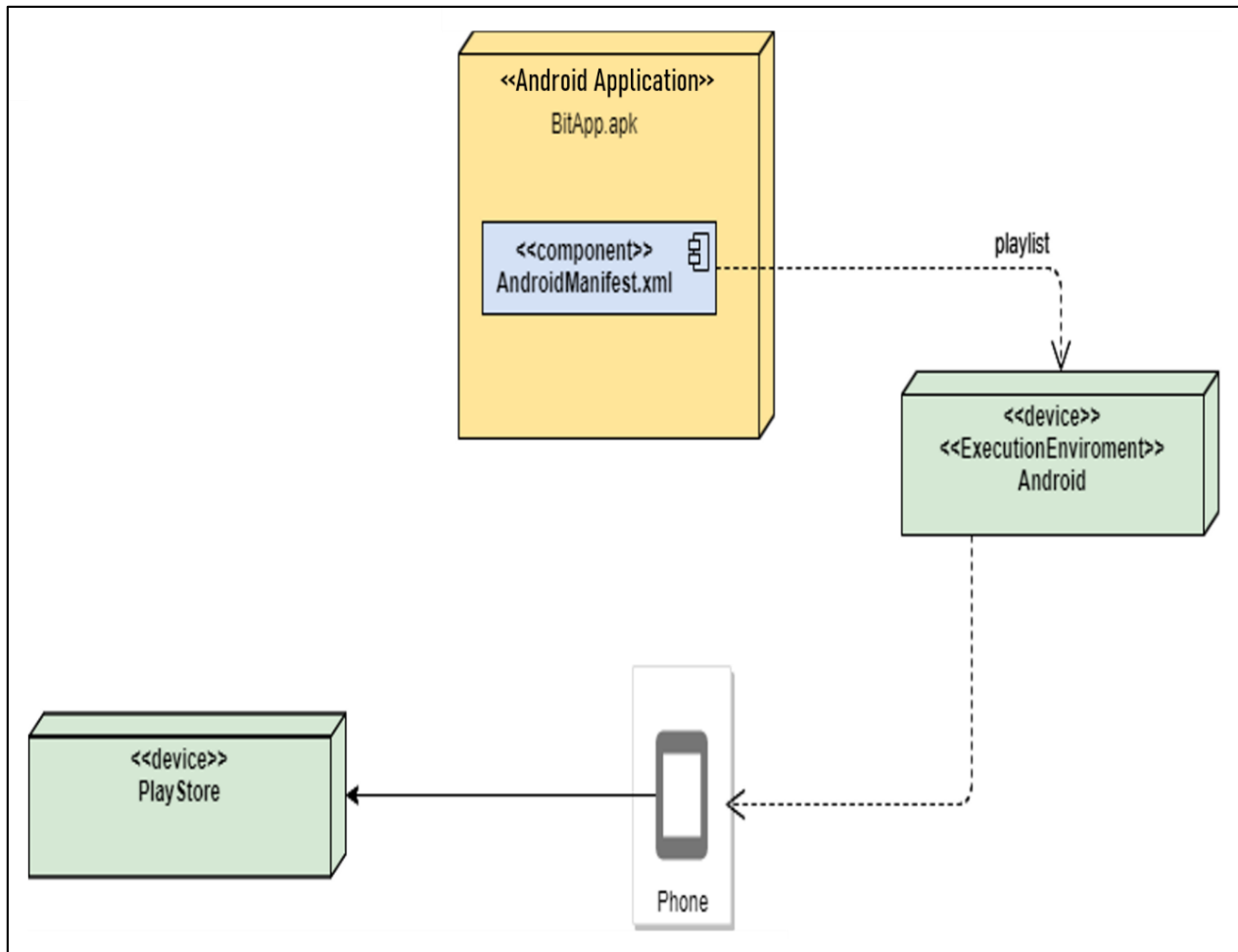


Figure 67. Deployment Diagram

In the architecture diagram (See Figure 68) the initial MVVM (Model-View-ViewModel) scheme can be seen in which what prevails is the decoupling of the entire visual, logical part of the idea and what is going to be related to the application.

This model is connected to the firebase of google where the part of the Model is found, through which everything that would be the data logic is observed, in addition to the View Models that will be in charge to interact with both the model and the view and finally the Views that will be the visual part.

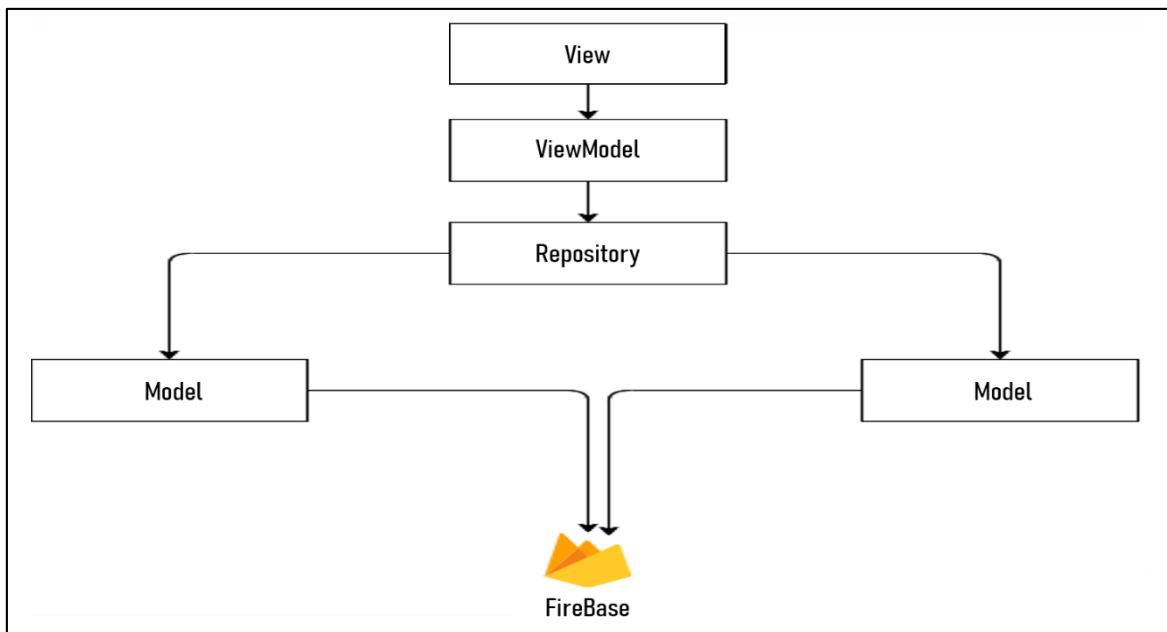


Figure 68. Architecture Diagram

Likewise, the component diagram is established (See Figure 69) that describes the physical elements of the system and their relationships where we find the user interacting with the component of the Mobile Application followed by the Server and ending with the FireBase component where the database with the SDK is hosted.

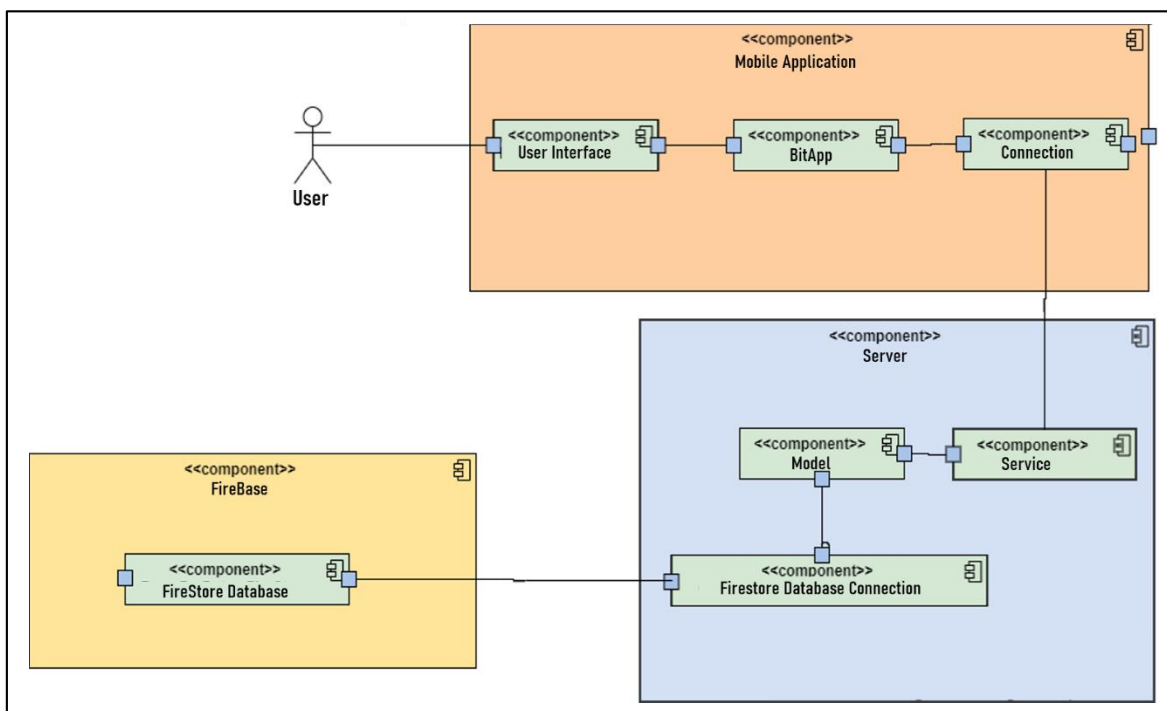


Figure 69. Component Diagram

We also find the class diagram (See Figure 70) that describes what must be present in the system being modeled, it also details the structure of a system showing the classes of the system, its attributes, operations and the relationships between objects, since it defines the classes that are used when going to the construction phase and the way in which they are related.

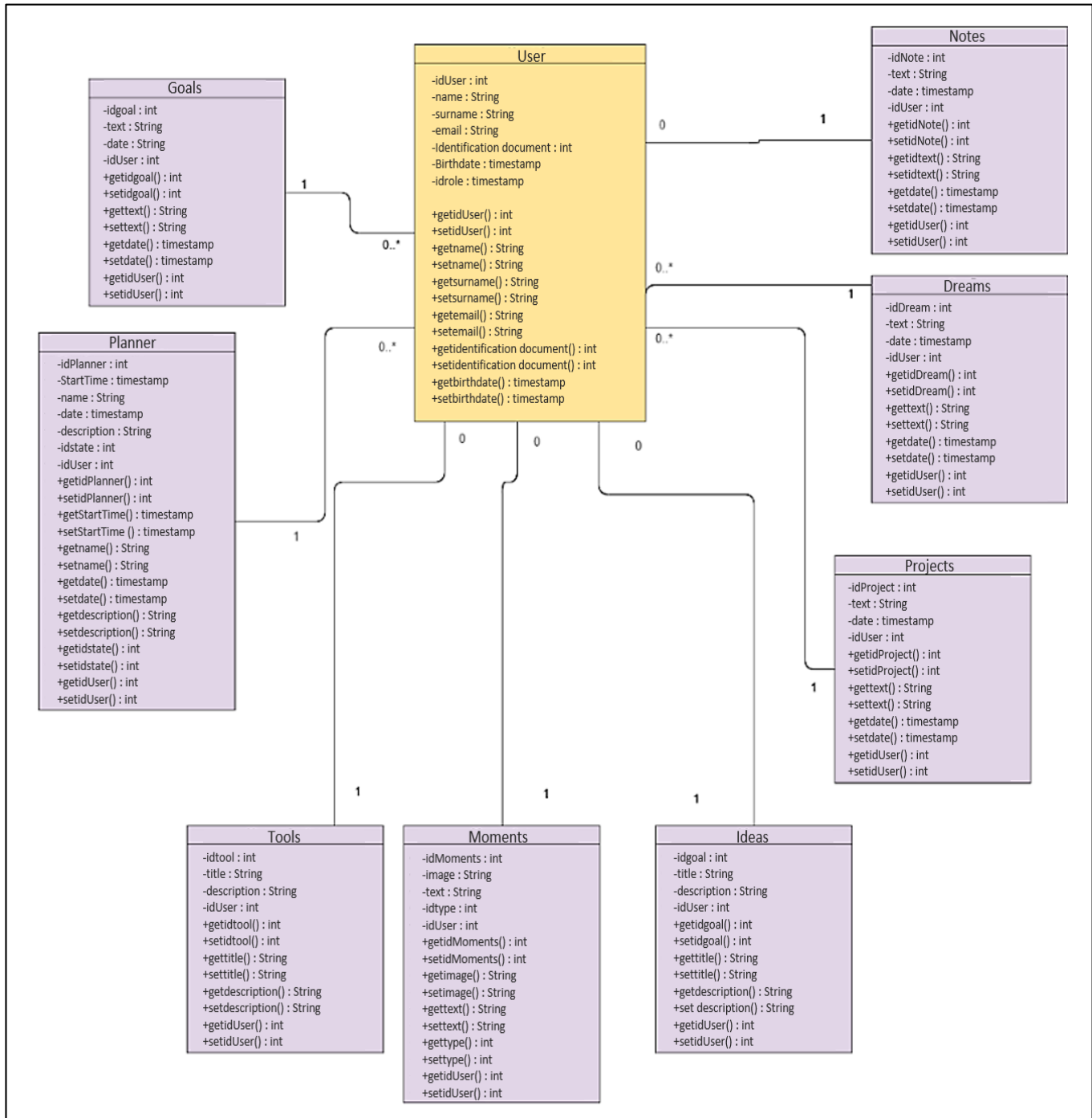


Figure 70. Class Diagram

In the same way, the Entity-Relationship Diagram (MER) (See Figure 71) is developed, which facilitates the representation of entities for data modeling that allows representing the relevant entities of an information system, as well as their interrelationships and properties illustrating the "entities", as people, objects or concepts and how they are related to each other within a system, using a defined set of symbols, such as rectangles, diamonds, ovals, and connecting lines to represent the interconnectedness of entities, relationships, and their attributes.

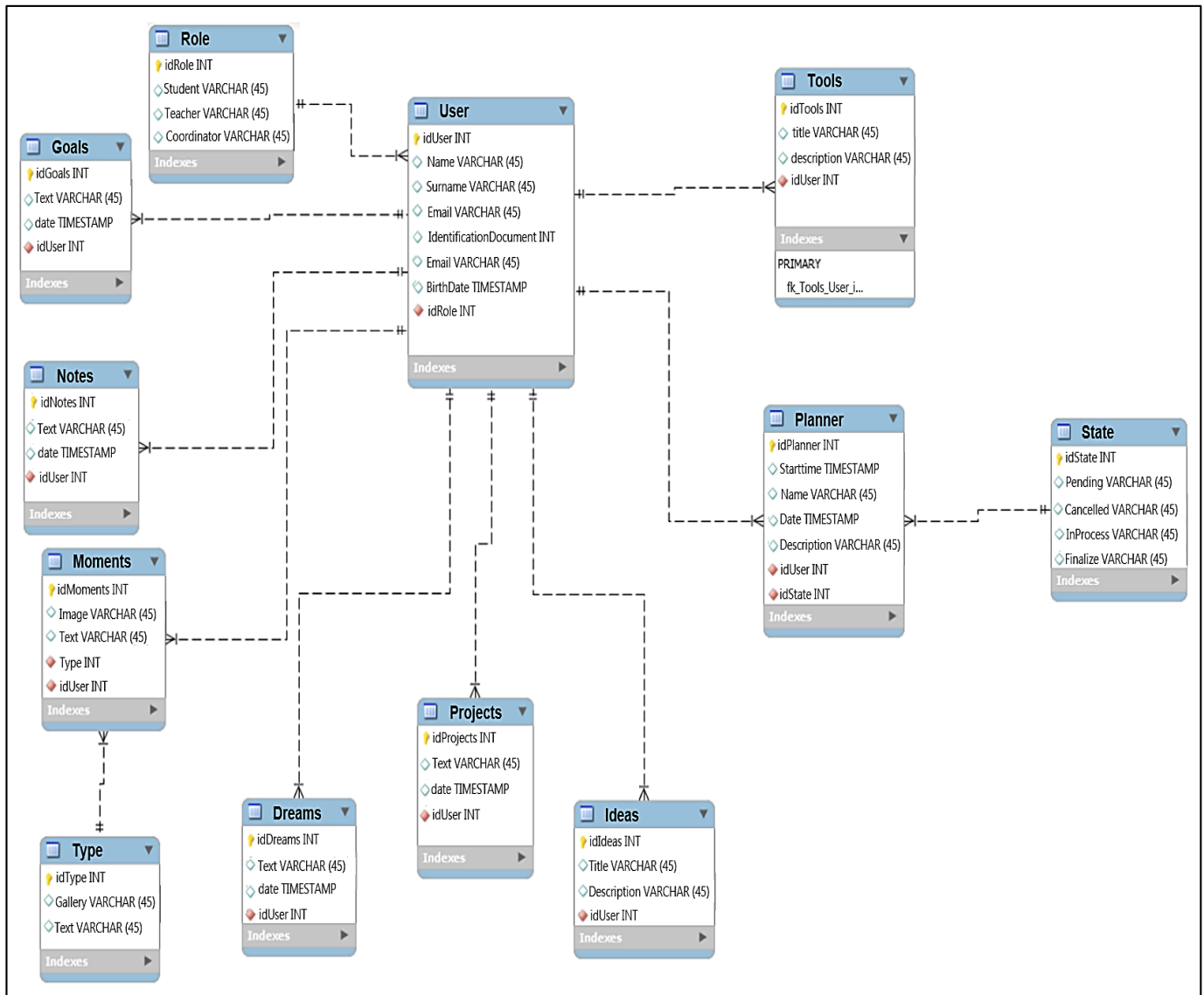


Figure 71. Entity-Relationship Diagram

In relation to the previous development of the different diagrams in UML, the application is developed through the user manual where the respective requirements for the operation of the mobile application are found, its installation and finally the use of it (See Annex B) said application is carried out using Kotlin which is a static typing programming language that runs on the Java virtual machine.

The main purpose of this App is to be a tool for the student of the "Universidad Católica de Colombia" you can have a clearer idea about what you want to do, how to carry out your life project and how to achieve your entrepreneurship proposal, accordingly, in order for the student to access the mobile application without any setback, the following must be taken into account:

➤ **Requirements.** For the bitAD application to work correctly it must have an Android operating system (5.0 or higher), a 100 Mb RAM memory and connectivity (3G and / or WIFI).

➤ **Installation.** Once the application is downloaded to the phone, its installation is carried out automatically (see figure 72). To use the BitAD application, you only need to touch the icon to open it and start working with it.

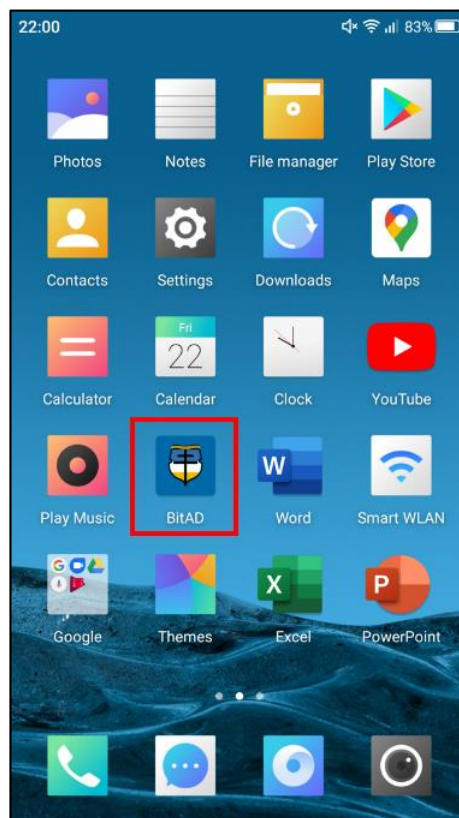


Figure 72. Phone Screen with the bitAD Application Icon

Concluding with the second and third stage of creativity and selection of Design Thinking, which comprise the phase of ideation, prototyping and testing (See Figure 73), a summary of the execution of these three phases is evident during the design the proposed prototype.

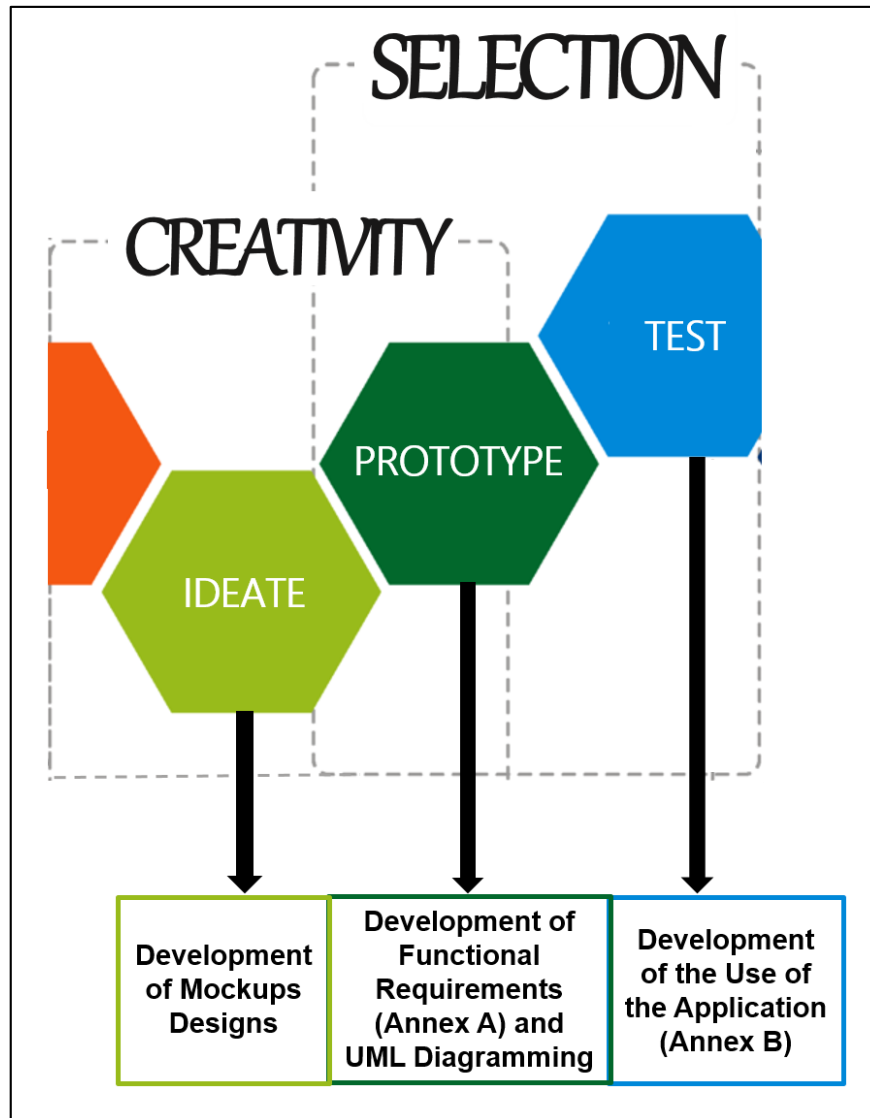


Figure 73. Creativity and Selection Stage of Design Thinking

11. VALIDATE THE PROTOTYPE

In the development of the fourth stage of design and execution of Design Thinking, the second part of the Testing phase is prepared and ends with the seventh Implementation phase, ending with this methodology, to complete the testing, a test protocol for the Mobile Application is carried out, seeking to verify its operation in practice, modifying and trying several times until obtaining the latest design, finally, for the implementation phase, the aim is to bring the prototype to real life by being in contact with the users to find out if the solution achieved the objective, waiting for possible improvements and learning during the process, but this phase could not be developed because the “Universidad Católica de Colombia” headquarters closed, entering a total quarantine in the country due to Covid-19.

The validation of the Mobile Application seeks that it complies with the functional requirements and quality protocols that are carried out by means of black box tests in which the functionality is verified without taking into account the internal code structure, implementation details or internal execution scenarios in the software, focuses only on the inputs and outputs of the system, it is considered that these tests allow finding incorrect or missing functions, interface errors, errors in data structures, in accesses to the databases external data or initialization and termination errors.

Next, the test protocols are evidenced, these performed for each of the functional requirements, taking into account the design of the Mockups with their respective results in the Application, starts with the test protocol of functional requirement 1 to register a user (See Table 17)

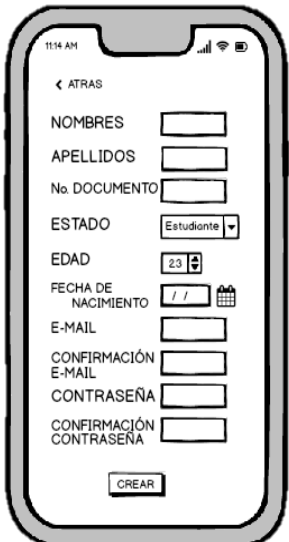

MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested? Does it comply? ¿ Partially Compliant? Test result	RF01 Register a user Yes Not RF01 is successfully registered in the database and successfully saved in the database	

Table 17. Test Protocol for RF01 - Register a User

Test protocol of functional requirement 2 to authenticate a user (See Table 18)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested? Does it comply? ¿ Partially Compliant? Test result	RF02	
		Authenticate a user Yes Not RF02 successfully authenticates the user and transfers it to the main application menu.	

Table 18. Test Protocol for RF02 - Authenticate a User

Test protocol of functional requirement 3 to recover user (See Table 19)

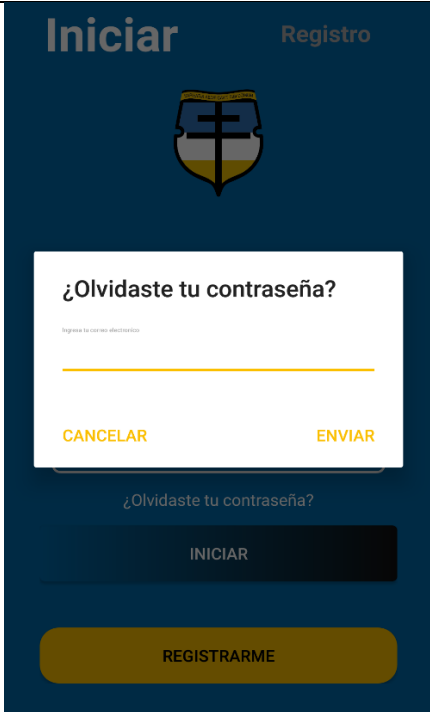
TEST PROTOCOL		APLICACION
Functional requirement What is tested? Does it comply? ¿ Partially Compliant? Test result	RF03	
	Recover user Yes Not RF03 recovers user correctly by entering the new password via email	

Table 19. Test Protocol for RF03 - Recover User

Test protocol of functional requirement 4 to access the main menu (See Table 20)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF04	
What is tested?	Access the main menu		
Does it comply?	Yes		
¿ Partially Compliant?	Not		
Test result	The RF04 once the application is authenticated, the main menu is accessed correctly		

Table 20. Test Protocol for RF04 - Access the Main Menu

Test protocol of functional requirement 5 to show item about us? (See Table 21)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested? Does it comply? ¿ Partially Compliant? Test result	RF05 Show item About us? Yes Not The RF05 the About us? item is displayed. right now this item is disabled	

Table 21. Test Protocol for RF05 - Show Item About us?

Test protocol of functional requirement 6 to show item my biography (See Table 22)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF06	
	What is tested?	Show item My Biography	
	Does it comply?	Yes	
¿ Partially Compliant?	Test result	Not	
		The RF06 the My Biography item is displayed and displayed correctly	

Table 22. Test Protocol for RF06 - Show Item My Biography

Test protocol of functional requirement 7 to show item how I feel? (See Table 23)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF07	
	What is tested?	Show item How I feel?	
	Does it comply?	Yes	
¿ Partially Compliant?	Test result	Not	
		The RF07 is displayed and the item How I feel? is displayed correctly	

Table 23. Test Protocol for RF07 - Show Item How I Feel?

Test protocol of functional requirement 7 to add note how I feel? (See Table 24)

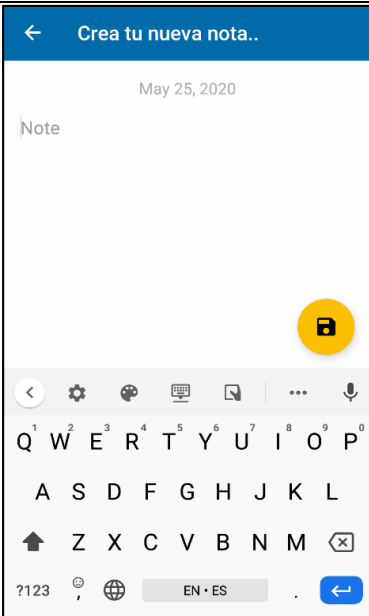
TEST PROTOCOL		APLICACION
Functional requirement	RF07	
What is tested?	Add note How I feel?	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	The RF07 added the note How I feel? and it is saved correctly in the database	

Table 24. Test Protocol for RF07 - Add Note How I Feel?

Test protocol of functional requirement 8 to show item dreams (See Table 25)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested? Does it comply? ¿ Partially Compliant? Test result	RF08 Show item dreams Yes Not The RF08 is displayed and the dream item is displayed correctly	

Table 25. Test Protocol for RF07 - Show Item Dreams

Test protocol of functional requirement 8 to add note of dreams (See Table 26)

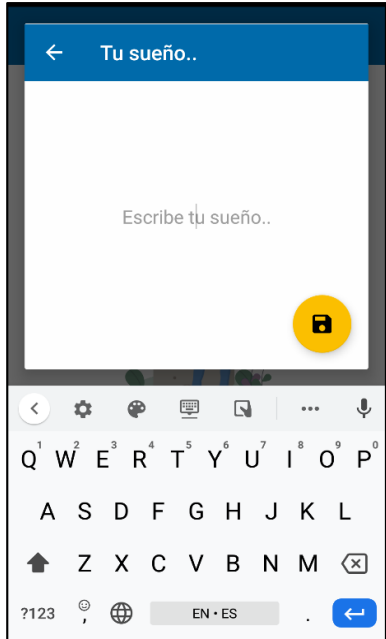
TEST PROTOCOL		APLICATION
Functional requirement	RF08	
What is tested?	Add note of Dreams	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	The RF08 dreams note is added and saved correctly in the database	

Table 26. Test Protocol for RF08 - Add Note of Dreams

Test protocol of functional requirement 8 to add project note (See Table 27)


TEST PROTOCOL		APLICATION
Functional requirement	RF08	
What is tested?	Add project note	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	The RF08 project Note is added and saved correctly in the database	

Table 27. Test Protocol for RF08 - Add Project Note

Test protocol of functional requirement 8 to add goal note (See Table 28)


TEST PROTOCOL		APLICACION
Functional requirement	RF08	
What is tested?	Add goal note	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	RF08 Note of Goals is added and saved correctly in the database	

Table 28. Test Protocol for RF08 - Add Goal Note

Test protocol of functional requirement 9 to show item tools to know me (See Table 29)


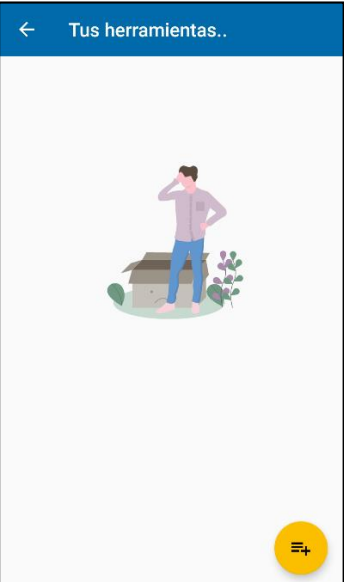
MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF09	
	What is tested?	Show item Tools to know me	
	Does it comply?	Yes	
	¿ Partially Compliant?	Not	
	Test result	The RF09 is displayed and the item Tools is to know me displayed correctly	

Table 29. Test Protocol for RF09 - Show Item Tools to Know me

Test protocol of functional requirement 9 to add item note tools to get to know me (See Table 30)

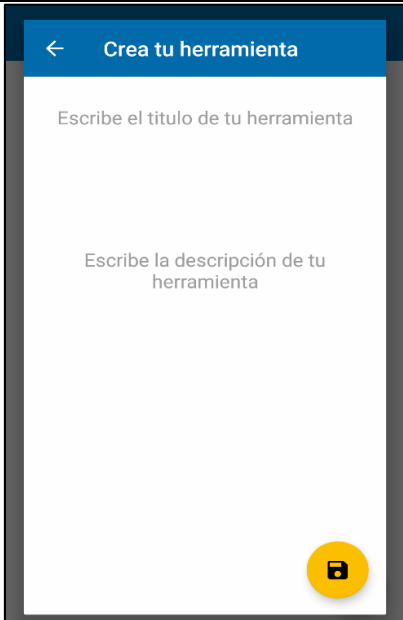
TEST PROTOCOL		APLICACION
Functional requirement	RF09	
What is tested?	Add item note Tools to get to know me	
Does it comply?	Yes	
¿ Partially Compliant? Test result	Not RF09 the Tools to know me note is added and saved correctly in the database	

Table 30. Test Protocol for RF09 - Add Item Note Tools to Get to Know me

Test protocol of functional requirement 10 to show item my glider (See Table 31)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF10	
	What is tested?	Show item My Glider	
	Does it comply?	Yes	
	¿ Partially Compliant? Test result	Not The RF10 is displayed and the My Glider item is displayed correctly	

Table 31. Test Protocol for RF10 - Show Item my Glider

Test protocol of functional requirement 10 to add an event (See Table 32)

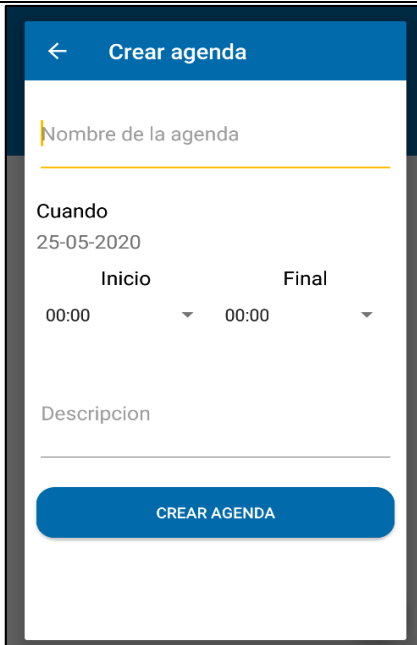
TEST PROTOCOL		APLICACION
Functional requirement	RF10	
What is tested?	Add an event	
Does it comply?	Yes	
¿ Partially Compliant? Test result	Not The RF10 event is added and saved correctly in the database	

Table 32. Test Protocol for RF10 - Add an Event

Test protocol of functional requirement 11 to show item special moments (See Table 33)

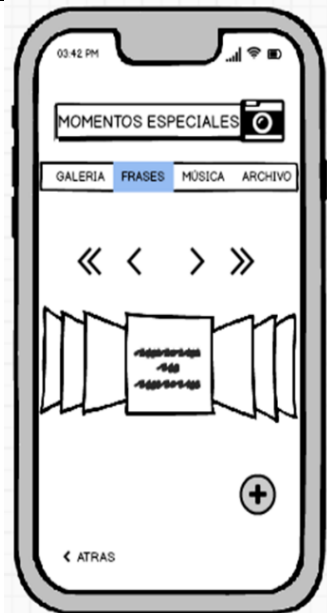
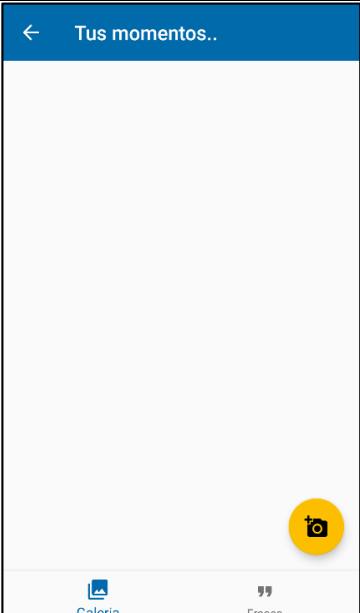
MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF11	
	What is tested?	Show item Special moments	
	Does it comply?	Yes	
	¿ Partially Compliant? Test result	Not The RF11 is displayed and the Special Moments item is displayed correctly	

Table 33. Test Protocol for RF11 - Show Item Special Moments

Test protocol of functional requirement 11 to add a photo to the galley (See Table 34)

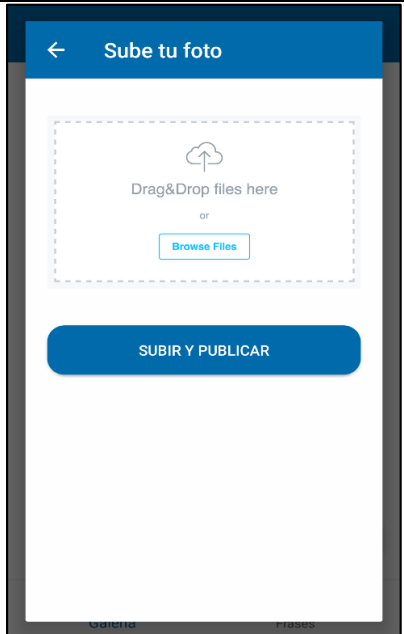
TEST PROTOCOL		APLICACION
Functional requirement	RF11	
What is tested?	Add a photo to the gallery	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	The RF11 adds a photo to the gallery. It is loaded in the application and saved correctly in the database	

Table 34. Test Protocol for RF11 - Add a Photo to the Gallery

Test protocol of functional requirement 11 to add a phrase (See Table 35)


TEST PROTOCOL		APLICACION
Functional requirement	RF11	
What is tested?	Add a phrase	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	RF11 adds a phrase. It is loaded in the application and saved correctly in the database	

Table 35. Test Protocol for RF11 - Add a Phrase

Test protocol of functional requirement 12 to show item UCatolica people (See Table 36)


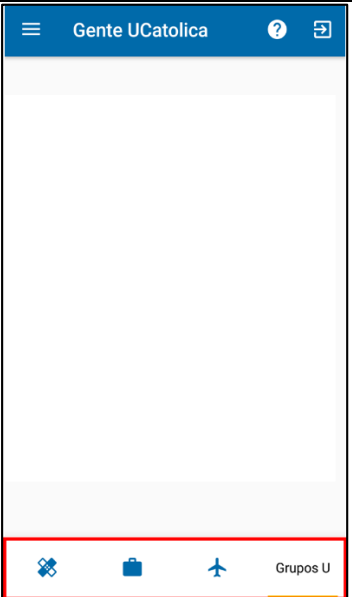
MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested?	RF12 Show item UCatolica People Yes	
	Does it comply? ¿ Partially Compliant? Test result	Not The RF12 is displayed and the UCatolica People item is displayed correctly	

Table 36. Test Protocol for RF12 - Show Item UCatolica People

Test protocol of functional requirement 13 to show item virtual psychology (See Table 37)


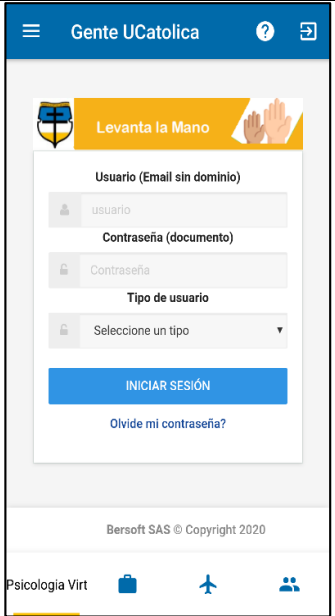
MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested?	RF13 Show item Virtual Psychology Yes	
	Does it comply? ¿ Partially Compliant? Test result	Not The RF13 is displayed and the Virtual Psychology item is displayed correctly	

Table 37. Test Protocol for RF13 - Show the Item Virtual Psychology

Test protocol of functional requirement 14 to show item volunteering of the “Universidad Católica de Colombia” (See Table 38)

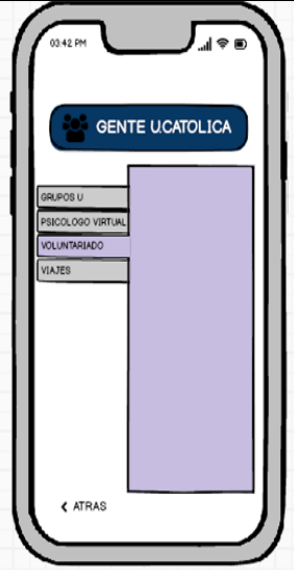
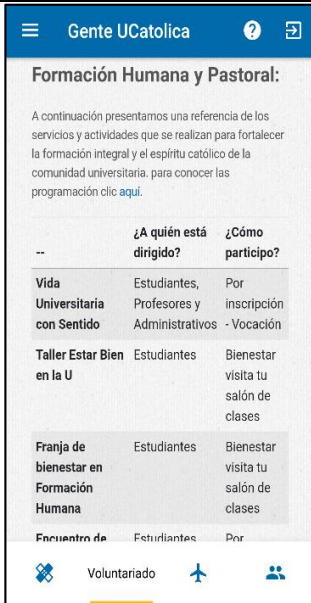
MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF14	
	What is tested?	Show item Volunteering of the “Universidad Católica de Colombia”	
	Does it comply?	Yes	
	¿ Partially Compliant?	Not	
	Test result	The RF14 is displayed and the item Volunteering of the Catholic University of Colombia is displayed correctly	

Table 38. Test Protocol for RF14 - Show the Item Volunteering

Test protocol of functional requirement 15 to show the item internationalization (See Table 39)

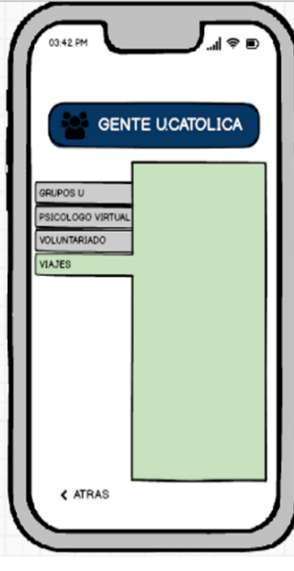

MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF15	
	What is tested?	Show the item Internationalization	
	Does it comply?	Yes	
	¿ Partially Compliant?	Not	
	Test result	The RF15 is displayed and the item Internationalization of the "Universidad Católica de Colombia" is displayed correctly	

Table 39. Test Protocol for RF15 - Show the Item Internationalization

Test protocol of functional requirement 16 to show the item groups U (See Table 40)

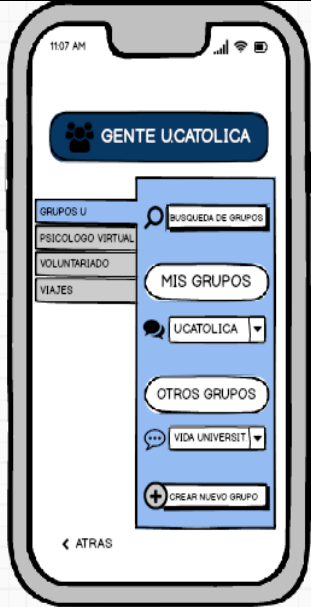

MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF16	
	What is tested? Does it comply? ¿ Partially Compliant? Test result	<p>Show the item Groups U</p> <p>Yes</p> <p>Not</p> <p>The RF16 displays the item Groups U of the "Universidad Católica de Colombia" correctly</p>	

Table 40. Test Protocol for RF16 - Show the Item Groups U

Test protocol of functional requirement 17 to show item spirituality (See Table 41)

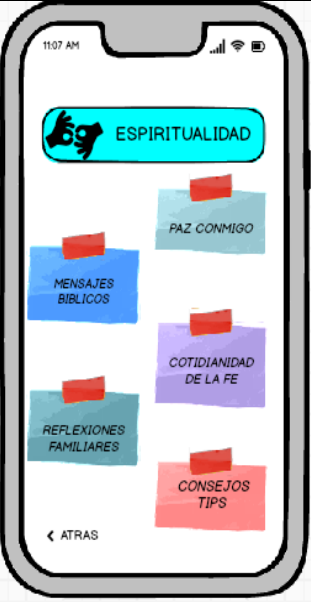

MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF17	
	What is tested? Does it comply? ¿ Partially Compliant? Test result	<p>Show item Spirituality</p> <p>Yes</p> <p>Not</p> <p>The RF17 item Spirituality is displayed correctly the moment this item is disabled</p>	

Table 41. Test Protocol for RF17 - Show Item Spirituality

Test protocol of functional requirement 18 to show item creativity (See Table 42)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF18	
	What is tested? Does it comply? ¿ Partially Compliant? Test result	Show item Creativity Yes Not The RF18 displays the Creativity item correctly	

Table 42. Test Protocol for RF18 - Show Item Creativity

Test protocol of functional requirement 19 to show item entrepreneurial ideas binnacle (See Table 43)


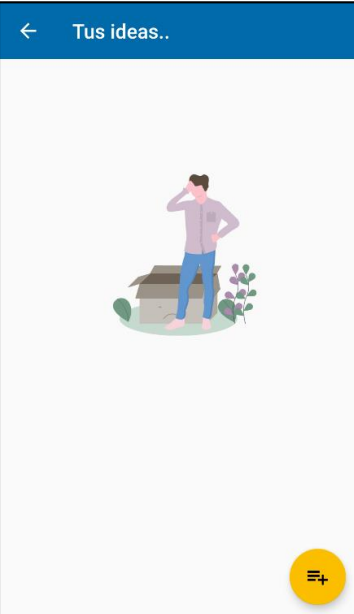
MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement	RF19	
	What is tested? Does it comply? ¿ Partially Compliant? Test result	Show item entrepreneurial ideas binnacle Yes Not RF19 displays the item entrepreneurial ideas binnacle correctly	

Table 43. Test Protocol for RF19 - Show Item Entrepreneurial Ideas Binnacle

Test protocol of functional requirement 19 to add a note about entrepreneurial ideas binnacle (See Table 44)

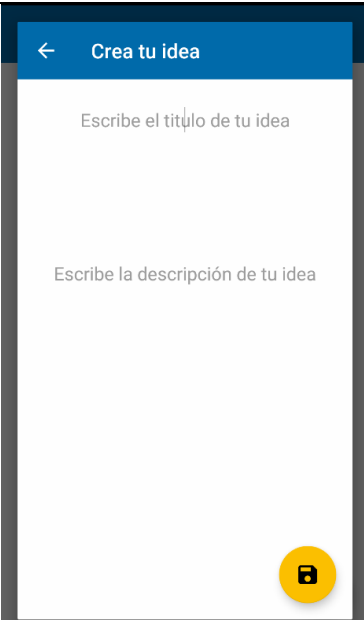
TEST PROTOCOL		APLICACION
Functional requirement	RF19	
What is tested?	Add a note about entrepreneurial ideas binnacle	
Does it comply?	Yes	
¿ Partially Compliant?	Not	
Test result	The RF19 adds a note on entrepreneurial ideas binnacle and is saved correctly in the database	

Table 44. Test Protocol for RF19 - Add a Note About Entrepreneurial Ideas Binnacle

Test protocol of functional requirement 20 to show item welfare university (See Table 45)



MOCKUPS	TEST PROTOCOL		APLICACION
	Functional requirement What is tested? Does it comply? ¿ Partially Compliant? Test result	RF20 Show item Welfare University Yes Not The RF20 displays the Welfare University item correctly	

Table 45. Test Protocol for RF20 - Show Item Welfare University

Test protocol of functional requirement 21 to show item UCatolica employment exchange (See Table 46)



MOCKUPS	TEST PROTOCOL		APPLICATION
	Functional requirement What is tested?	RF21 Show item UCatolica employment exchange	
	Does it comply? ¿ Partially Compliant?	Yes Not	
	Test result	The RF21 item UCatolica employment exchange is displayed correctly	

Table 46. Test Protocol for RF21 - Show Item UCatolica Employment Exchange

Concluding with the last stage of design and execution of Design Thinking, which consists of the testing and implementation phase (See Figure 74), a summary of the execution of these two phases is evident during the validation of the prototype.

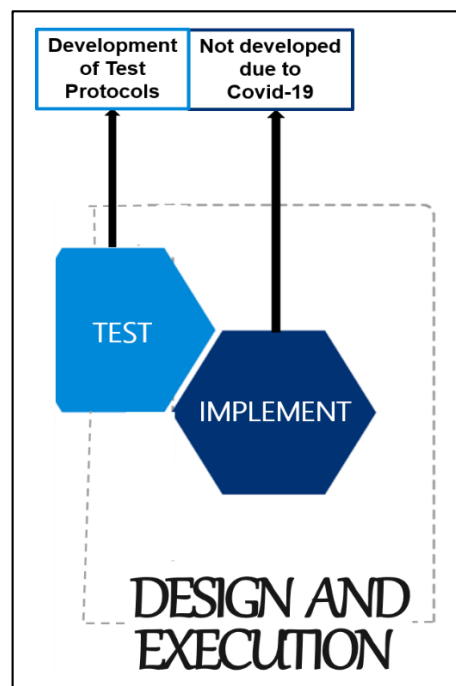


Figure 74. Design and Execution Stage of Design Thinking

12. CONCLUSIONS AND FUTURE WORKS

A challenge for the “Universidad Católica de Colombia” is that its students understand and generate the reflective construction of their life project conceiving it as “... the model in which your aspirations for personal fulfillment are designed” and it has as reference and reflection "truth, beauty, good and transcendence", common and predictable aspects of the human condition and its development. The life project conceived as a model, establishes the set of reflections, conditions-mechanisms and criteria on which the personal, formative and social actions that the educational community advances from the processes or substantive missionary functions in favor of the formation of the person converge, accordingly, it was evident that an important part for said construction is that the students have the necessary tools for their development, where the understanding of said concept is generated in a pleasant way and close to the daily life of the students, where their opinions and recommendations are taken into account to find a solution that directly reaches what they need, noting that the Design Thinking methodology helps a perfect understanding of the user approaching a real and more grounded solution, taking into account all the parties interested in this process and the experts so that in this way a product is generated that fully satisfies the student's needs.

According to the brainstorming generated by the students for the creation of the proposed Mockups, a final version of said Mockups is developed, from which the different requirements and diagrams for the construction of the Mobile Application begin to be generated, this in order to comply with the actual development of the prototype, executing the different validations to test its operation in a practical way and try said procedure several times until the final design is reached, thus implementing it in the real environment with the users.

The Mobile Application will bring as benefits for the “Universidad Católica de Colombia” the opportunity to approach young people through new computer tools being at the forefront of technology, considering that its mission is centered on the person, it will help to promote and encourage students who seek to make an introspective reflection on their lives, taking it into account to be able to generate their life project, where the creation of new ventures and the generation of added value for students is conceived so that at the end they have a clear idea of their business through a personal canvas and contribute to their personal and professional improvement.

The icons that are currently disabled, such as About us?, Spirituality and Groups U, will be developed for the second version of the Mobile Application, which carry out the pertinent investigations, but it is necessary to finalize some processes of each one of them, likewise, the option of constructing my value proposal through which the way to automatically generate personal Canvas is sought.

Finish the implementation phase of Design Thinking through which the prototype is applied in the real environment so that users have the opportunity to directly interact with the Mobile Application and thus learn about possible improvements in it.

Develop a feasibility analysis for future interaction options on the tools previously proposed by the students, considered in order of importance as necessary or indifferent for the first version of the Mobile Application.

It is suggested for future research to carry out a study showing the effectiveness for the creation of agreements or strategic alliances with different entities that can provide tools for student creativity and entrepreneurship.

Expand the extension of access to the App, recognizing and applying it to the entire educational community of the institution (postgraduate, administrative, teaching), including them in the participation of its construction of the life project, generating a culture in all those who constitute the institution, in addition, studies must be carried out that include teachers from other faculties or expertise that can contribute significantly from their external knowledge and also expand the range of possibilities that the Mobile Application currently has.

Through data collection, develop indicators that allow us to show and know how many students are or have been developing the five phases of the Mobile Application and how many of them have developed projects where their idea ends in implementation, in order to control and know how effective and striking the App is for students.

You are invited to carry out a market study to find out the feasibility of incorporating new market segments into the project, such as educational settings for secondary education, other levels of higher education (technical professional level, technological level) or for different systems of formal or non-formal education.

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ANNEXES

ANNEX A. REQUIREMENTS

A.1 INTRODUCTION

This document is a Software Requirements Specification (ERS) for the notebook for mobile devices of introspective registration to generate ventures. This specification has been structured based on the guidelines given by the standard IEEE recommended practice for Software Requirements Specifications ANSI/IEEE 830, 1998.

It also consists of three sections, initially an overview of the application resource specification is provided, in the second section a general description of the system is made, in order to know the main functions that it must perform, the associated data and the factors, restrictions, assumptions and dependencies that affect development, without going into too much detail, finally, the requirements that the system must satisfy are defined in detail.

A.1.1 PURPOSE

The purpose of this document is to define the functional and non-functional specifications for the development of a mobile application that will allow to show by means of a notebook the ideas of the students for the construction of their life project. This will be used by students, teachers and coordinators.

A.1.2 SCOPE

This requirement specification is intended for the system user, to be able to achieve through this application that the student has reflected in the notebook each thought and as your ideas progress, your life project is built with the help of this application, which is the main scope.

A.1.3 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

NAME	DESCRIPTION
User	Person who will use the application to interact and manage the processes of this
ERS	Software Requirements Specification
RF	Functional requirement
RNF	Non-functional requirement

Table A1. Meaning of Abbreviations

A.2 GENERAL DESCRIPTION

A.2.1 PRODUCT PERSPECTIVE

The virtual notebook for introspective registration mobile devices to generate entrepreneurship will be a product designed to interact through cell phones, which will allow its use quickly and efficiently, it will be a user-friendly environment (Administrator, student, teacher and coordinator).

A.2.2 PRODUCT FUNCTIONALITY

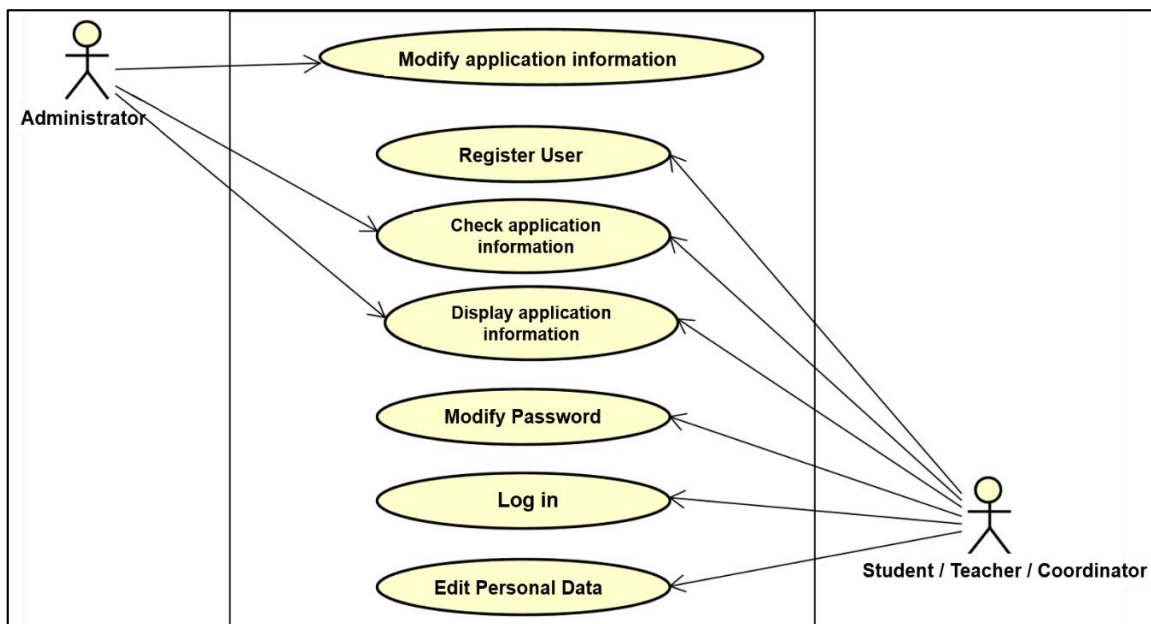


Figure A1. Product Functionality

A.2.3 USER CHARACTERISTICS

TYPE OF USER	FORMATION	ACTIVITIES
Administrator	Systems Engineer	Control and management of the system in general
Teacher	Educator	Participation in the different items of the application
Student	Undergraduate	Participation in the different items of the application
Coordinator	Educator	Participation in the different items of the application

Table A2. User Characteristics

A.2.4 RESTRICTIONS

Languages and technologies in use: Kotlin. The system must have a simple design and implementation, independent of the platform or the programming language.

A.2.5 ASSUMPTIONS AND DEPENDENCIES

The requirements described here are assumed to be stable. The computers where the application is going to be executed must meet the aforementioned requirements to guarantee a correct execution of the application.

A.3 SPECIFIC REQUIREMENTS

A.3.1 FUNCTIONAL REQUIREMENTS

A.3.1.1 Functional requirement 1. The user must supply data such as: Name, Surname, E-mail, State, Age, Date of birth, User and Password.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF01
Name of the Request	Register Users.
Input	Submit information: Names, Surnames, Email, State, Age, Birthdate, User, Password.
Output	User registration with the ability to have an account based on the following characteristics: Names, Surnames, Email, State, Age, Birthdate, User, Password.
Characteristics	Users must register in the system to access any part of the mobile application
Description of the requirement	The mobile application will allow the user (Administrator, student, teacher and coordinator) to register. The user must supply data such as: Name, Surname, Email, State, Age, Date of birth, User and Password.
NON-functional requirement	RNF01 RNF02 RNF05 RNF06
Priority of the requirement	High

Table A3. Functional requirement 1- Register Users

A.3.1.2 Functional requirement 2. The user must supply data to authenticate. User and password.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF02
Name of the Request	User authentication
Input	User and Password
Output	A user account with the ability to enter the application, with these characteristics: User and Password
Characteristics	Users must identify themselves to access any part of the mobile application.
Description of the requirement	The mobile application may be consulted by any user (Administrator, student, teacher and coordinator) depending on the module in which it is located and its level of accessibility. The user must supply data to authenticate. User and password.
NON-functional requirement	RNF01 RNF02 RNF05 RNF06
Priority of the requirement	High

Table A4. Functional requirement 2 - User Authentication

A.3.1.3 Functional requirement 3. The mobile application may send a URL to update the password to the E-mail. The user must put the E-mail to verify in the database and send the data.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF03
Name of the Request	Account recovery
Input	Email
Output	User and Password
Characteristics	The application offers the option of recovering the user's account in case the user forgets his username and / or password.

Table A5. Functional requirement 3 - Account Recovery

REQUIREMENT CONDITIONS	RESULTS
Description of the requirement	The mobile application may send a URL to update the password to the Email. The user must place the Email to verify in the database and send the data. The application verifies the mail and sends the data of the respective user (Username and URL to update password).
NON-functional requirement	RNF01 RNF02 RNF05 RNF06
Priority of the requirement	High

Table A5. Functional requirement 3 - Account Recovery (Continuation)

A.3.1.4 Functional requirement 4. Show general information about the 5 main items that make up the tool about us?, My biography, UCatolica People, Spirituality, Creativity

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF04
Name of the Request	Consult information.
Input	Main menu display request
Output	Main menu display
Characteristics	The mobile application will offer the user general information About us?, My Biography, UCatolica People, Spirituality, Creativity
Description of the requirement	It shows general information about the 5 main items that make up the About up? My Biography, UCatolica People, Spirituality, Creativity
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A6. Functional requirement 4 - Consult Information

A.3.1.5 Functional requirement 5. Currently for the next version of the application

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF05
Name of the Request	Display item About us?
Input	Request to view the item About us?
Output	Item display About us?
Characteristics	The application will display the menu of the section About us?
Description of the requirement	Clicking on the section of the About us? The options of Human Nature, Human Importance, Social Recognition, Training, and Citizen Responsibility will be displayed. (Currently for the next version of the application)
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A7. Functional requirement 5 - Display Item About Us?

A.3.1.6 Functional requirement 6. The item My biography will display the options of How I feel?, dreams Projects and goals, Tools to know me, My glider and Special moments.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF06
Name of the Request	Display item My biography
Input	Request to view the item My biography
Output	Item display My biography
Characteristics	The application will display the menu of the section My Biography
Description of the requirement	Clicking on the section of the item My biography The options of How I feel ?, dreams Projects and goals, Tools to know me, My glider, Special moments will be displayed.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A8. Functional requirement 6 - Display Item My Biography

A.3.1.7 Functional requirement 7. The How I Feel? section will display the option to add notes and view them for later.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF07
Name of the Request	Display item How I feel?
Input	Request to view the item How I feel?
Output	Item display How I feel?
Characteristics	The application will display the item How I feel?
Description of the requirement	Clicking on the item section How I feel? The option to add notes will be displayed and can be viewed for later.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A9. Functional requirement 7 - Display Item How I Feel?

A.3.1.8 Functional requirement 8. The Dreams section will display the Dreams, Projects and Goals options, each a different list to add notes respectively to the desired item.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF08
Name of the Request	Display item dreams
Input	Request to view item dreams
Output	Item display dreams
Characteristics	The application will display the item dreams
Description of the requirement	Clicking on the item section dreams. The Dreams, Projects and Goals options will be displayed, each one a different list to add notes respectively to the desired item.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A10. Functional requirement 8 - Display Item Dreams

A.3.1.9 Functional requirement 9. The Tools to know me section will display the option of adding the description of tools that will be used by the user.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF09
Name of the Request	Display item Tools to know me
Input	Request to view item Tools to know me
Output	Item display Tools to know me
Characteristics	The application will display the item Tools to know me
Description of the requirement	Clicking on the section of the item Tools to know me The option to add the description of tools that will serve for the user process will be displayed.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A11. Functional requirement 9 - Display Item Tools to Know me

A.3.1.10 Functional requirement 10. The My glider section will display a small itinerary in which to add events giving a title, time and description, the event can present statuses such as: Finish, in Process, Pending and Canceled.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF10
Name of the Request	Display item My glider
Input	Request to view the item My glider
Output	Item display My glider
Characteristics	The application will display the item My glider
Description of the requirement	Clicking on the My glider item section A small itinerary will be displayed in which to add events giving a title, time and description, the event can present statuses such as Finish, in process, Pending and Canceled.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A12. Functional requirement 10 - Display Item My Glider

A.3.1.11 Functional requirement 11. The Special Moments section will display the gallery and phrase options. In the gallery section you can add photos and images and in the phrases section the user can enter texts.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF11
Name of the Request	Display item Special moments
Input	Request to display the item Special moments
Output	Item display Special moments
Characteristics	The application will display the item Special moments
Description of the requirement	Clicking on the section of the item Special Moments The options of galleries and phrases will be displayed, in the gallery section you can add photos and images, in the phrases section the user can enter texts
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A13. Functional requirement 11 - Display Item Special Moments

A.3.1.12 Functional requirement 12. The UCatolica People item will display the Virtual Psychology, Volunteer, Internalization and Groups U menu.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF12
Name of the Request	Display item UCatolica People
Input	Request to display the item UCatolica People
Output	Item display UCatolica People
Characteristics	The application will display the menu of the UCatolica People section.
Description of the requirement	Clicking on the UCatolica People section of the item will display the Virtual Psychology, Volunteer, Internalization and Groups U menu.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A14. Functional requirement 12 - Display Item UCatolica People

A.3.1.13 Functional requirement 13. The Virtual Psychology item section will display a view of adviser.ucatolica.edu.co/Adviser/app/login.php.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF13
Name of the Request	Display item Virtual Psychology
Input	Request to display the item Virtual Psychology
Output	Visualization of item Virtual Psychology
Characteristics	The application will send the user to the Virtual Psychology link of the “Universidad Católica de Colombia”.
Description of the requirement	Clicking on the Virtual Psychology item section will display a view of adviser.ucatolica.edu.co/Adviser/app/login.php .
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A15. Functional requirement 13 - Display Item Virtual Psychology

A.3.1.14 Functional requirement 14. The Volunteer item section will display a view of www.ucatolica.edu.co/portal/vida-universitaria/formacion-humana-pastoral-y-capellania/.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF14
Name of the Request	Display item Volunteering
Input	Request to display the item Volunteering
Output	Item display Volunteering
Characteristics	The application will send the user to the Volunteer link of the “Universidad Católica de Colombia”.
Description of the requirement	Clicking on the Volunteering item section will display a view of www.ucatolica.edu.co/portal/vida-universitaria/formacion-humana-pastoral-y-capellania/ .
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A16. Functional requirement 14 - Display Item Volunteering

A.3.1.15 Functional requirement 15. The Internalization item section will display a view of www.ucatolica.edu.co/portal/orii/home/.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF15
Name of the Request	Display item Internalization
Input	Request to display the item Internalization
Output	Item display Internalization
Characteristics	The application will send the user to the Internalization link of the “Universidad Católica de Colombia”.
Description of the requirement	Clicking on the Internalization item section will display a view of www.ucatolica.edu.co/portal/orii/home/ .
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A17. Functional requirement 15 - Display Item Internalization

A.3.1.16 Functional requirement 16. The Groups U section will display a view of the groups section of the “Universidad Católica de Colombia” to be able to interact with the members of the respective groups. (Currently for the next version of the application)

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF16
Name of the Request	Display item Groups U
Input	Request to display the item Groups U
Output	Item display Internalization
Characteristics	The application will send the user to the item Groups U where the list of groups that the student belongs to will be displayed and they will be able to see the comments of the groups in which it is integrated.

Table A18. Functional requirement 16 - Display Item Groups U

REQUIREMENT CONDITIONS	RESULTS
Description of the requirement	Clicking on the Groups U item section will display a view of the groups section of the “Universidad Católica de Colombia” in order to interact with the members of the respective groups. (Currently for the next version of the application)
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A18. Functional requirement 16 - Display Item Groups U (Continuation)

A.3.1.17 Functional requirement 17. The item Spirituality will take the user with quotes related to biblical quotes, family reflections, peace and advice. (Currently for the next version of the application)

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF17
Name of the Request	Display item Spirituality
Input	Request to view the item Spirituality
Output	Item display Spirituality
Characteristics	The application will display the menu of the item Spirituality
Description of the requirement	Clicking on the Spirituality menu section the application will take the user with quotes related to biblical quotes, family reflections, peace and advice. (Currently for the next version of the application)
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A19. Functional requirement 17 - Display Item Spirituality

A.3.1.18 Functional requirement 18. The item Creativity will display the sections of the Entrepreneurial Ideas Binnacle, Welfare university and UCatolica Employment Exchange.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF18
Name of the Request	Display item Creativity
Input	Item display request Creativity
Output	Item display Creativity
Characteristics	The application will display the menu of the item Creativity
Description of the requirement	Clicking on the Creativity item section will display the sections for the Entrepreneurial Ideas Binnacle, Welfare university and UCatolica Employment Exchange.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A20. Functional requirement 18 - Display Item Creativity

A.3.1.19 Functional requirement 19. The Entrepreneurial Ideas Binnacle section will display the notes the user has written and enter new notes about their entrepreneurship ideas.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF19
Name of the Request	Display item Entrepreneurial Ideas Binnacle
Input	Request to view the item Entrepreneurial Ideas Binnacle
Output	Visualization of item Entrepreneurial Ideas Binnacle
Characteristics	The application will display the item of Entrepreneurial Ideas Binnacle the user will be able to add notes about their entrepreneurial ideas.
Description of the requirement	Clicking on the section of the item Entrepreneurial Ideas Binnacle will display the notes that the user has written and enter new notes about their entrepreneurship ideas.
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A21. Functional requirement 19 - Display Item Entrepreneurial Ideas Binnacle

A.3.1.20 Functional requirement 20. The Welfare university section will display a view of www.ucatolica.edu.co/portal/vida-universitaria/.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	R20
Name of the Request	Display item Welfare university
Input	Request to view the item Welfare university
Output	Display of item Welfare university
Characteristics	The application will send the user to the Welfare university link of the “Universidad Católica de Colombia”.
Description of the requirement	Clicking on the section of the item Welfare university will display a view of www.ucatolica.edu.co/portal/vida-universitaria/ .
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A22. Functional requirement 20 - Display Item Welfare University

A.3.1.21 Functional requirement 21. The UCatolica Job Exchange section will display a view of mitrabajo.ucatolica.edu.co/.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF21
Name of the Request	Display item UCatolica Employment Exchange
Input	Request to view the item UCatolica Employment Exchange
Output	Item display UCatolica Employment Exchange
Characteristics	The application will send the user to the link of the UCatolica Employment Exchange of the “Universidad Católica de Colombia”.
Description of the requirement	Clicking on the UCatolica Employment Exchange item section will display a view of mitrabajo.ucatolica.edu.co/ .
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A23. Functional requirement 21 - Display Item UCatolica Job Exchange

A.3.1.22 Functional requirement 22. The mobile application will allow the administrator from the database to observe and modify the information contained in the application, data of the users hosted in it.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF22
Name of the Request	Modify Information (Administrator)
Input	Data to modify
Output	Updated data confirmation
Characteristics	The mobile application will allow the administrator from the database to observe and modify the information contained in the application, data of the users hosted in it.
Description of the requirement	Allows the administrator to modify all the information of the mobile application
NON-functional requirement	RNF01 RNF02
Priority of the requirement	High

Table A24. Functional requirement 22 - Modify Information (Administrator)

A.3.1.23 Functional requirement 23. It allows the administrator to modify their personal data from the application's database.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF23
Name of the Request	Modify personal information (administrator).
Input	Data to be modified
Output	Updated data confirmation
Characteristics	The mobile application will allow the administrator to modify the information contained in his personal data that he previously registered in his account from the database.
Description of the requirement	Allows the user to modify their personal data
NON-functional requirement	RNF01 RNF02 RNF05
Priority of the requirement	High

Table A25. Functional requirement 23 - Modify Personal Information (Administrator)

A.3.1.24 Functional requirement 24. It allows the teacher, once they have signed in with their account, to supply relevant topics to the students, while maintaining active communication. (Currently the Teacher will not have this function)

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF24
Name of the Request	Notebook management.
Input	The teacher enters the application in the Notebook of entrepreneurial ideas
Output	Provision of teacher information
Characteristics	Allows you to manage information regarding the Notebook.
Description of the requirement	It allows the teacher, once they have signed in with their account, to supply relevant topics to the students, while maintaining active communication. (Currently the Teacher will not have this function).
NON-functional requirement	RNF01 RNF02 RNF05 RNF06
Priority of the requirement	High

Table A26. Functional requirement 24 - Notebook Management

A.3.1.25 Functional requirement 25. It allows the coordinator, once they have signed in with their account, to supervise the teacher and the student in their participation in the notebook of entrepreneurial ideas. (Currently the Coordinator will not have this function)

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RF25
Name of the Request	Notebook supervision
Input	The coordinator enters the application in the Notebook of entrepreneurial ideas
Output	Notebook management
Characteristics	Allows the management of the Notebook to the coordinator

Table A27. Functional requirement 25 - Notebook Supervision

REQUIREMENT CONDITIONS	RESULTS
Description of the requirement	It allows the coordinator once they have accessed their account, supervises the teacher and student in their participation in the Notebook of entrepreneurial ideas. (Currently the Coordinator will not have this function)
NON-functional requirement	RNF01 RNF02 RNF05 RNF06 RNF07
Priority of the requirement	High

Table A27. Functional requirement 25 - Notebook Supervision (Continuation)

A.3.2 NON-FUNCTIONAL REQUIREMENTS.

4.3.2.1 System interface. Guarantee that the design of the application is simple and user friendly.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RNF01
Name of the Request	System interface.
Characteristics	The system will present a simple user interface to make it easy for users of the system.
Description of the requirement	The system must have an intuitive and simple user interface.
Priority of the requirement	High

Table A28. Non-Functional Requirements 1 - System Interface

A.3.2.2 Maintenance. The system must have easily updated documentation that allows maintenance operations to be carried out with the least possible effort.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RNF02
Name of the Request	Maintenance.
Characteristics	The system must have an installation manual and user manual to facilitate maintenance that will be performed by the administrator.

Table A29. Non-Functional Requirements 2 – Maintenance

REQUIREMENT CONDITIONS	RESULTS
Description of the requirement	The system must have easily updated documentation that allows maintenance operations to be carried out with the least possible effort.
Priority of the requirement	High

Table A29. Non-Functional Requirements 2 – Maintenance (Continuation)

A.3.2.3 Design of the interface to the web feature. The system must have a coherent interface similar to the design of the “Universidad Católica de Colombia”.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RNF03
Name of the Request	Design of the interface to the web feature.
Characteristics	The system must have a user interface, taking into account the characteristics of the institution's website.
Description of the requirement	The user interface must adjust to the characteristics of the institution's website, within which the inventory and process management system will be incorporated.
Priority of the requirement	High

Table A30. Non-Functional Requirements 3 - Design of the Interface to the Web Feature

A.3.2.4 Performance. The performance of the application with respect to the items that each user registers on the page must be well supported.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RNF04
Name of the Request	Performance.
Characteristics	The system will guarantee users a performance in terms of the data stored in the system, offering reliability to it.
Description of the requirement	Guarantee the performance of the computer system to different users. In this sense, the stored information or records made may be consulted and updated permanently and simultaneously, without affecting the response time.
Priority of the requirement	High

Table A31. Non-Functional Requirements 4 – Performance

A.3.2.5 Security of the information. The application in its database will keep users' personal data confidential and only the database administrator will be able to see the data for each item of the tool.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RNF05
Name of the Request	Information security
Characteristics	The system will guarantee users security regarding the information that is processed in the system.
Description of the requirement	Guarantee the security of the system with respect to the information and data that are handled such as documents, files and passwords.
Priority of the requirement	High

Table A32. Non-Functional Requirements 5 - Information Security

A.3.2.6 Portability. The system will be implemented under the Android platform.

REQUIREMENT CONDITIONS	RESULTS
Identification of the requirement	RNF06
Name of the Request	Portability.
Characteristics	The system must be supported by the Android platform.
Description of the requirement	Guarantee that the application can run problems on the Android mobile platform.
Priority of the requirement	High

Table A33. Non-Functional Requirements 6 – Portability

A.3.3 COMMON INTERFACE REQUIREMENTS

A.3.3.1 User interfaces. The user interface will consist of a set of windows with buttons, lists and text fields. This should be built specifically for the proposed system (Android) and it should be displayed in the mobile application.

A.3.3.2 Hardware interfaces. It will be necessary to have an Android 9 or higher device. In previous systems it can take a long time to load the application.

A.3.3.3 Software interfaces. Operating system: Android.

ANNEX B. USE OF THE APP

In the following document, the use of the bitAD mobile application is explained, once the icon is located in the applications menu or on the phone screen, click on it to start automatically.

On the home screen (See Figure B1) you must enter the data and press "Iniciar", in case you do not have a registered user you must enter "Registrarme" to continue and use the application.

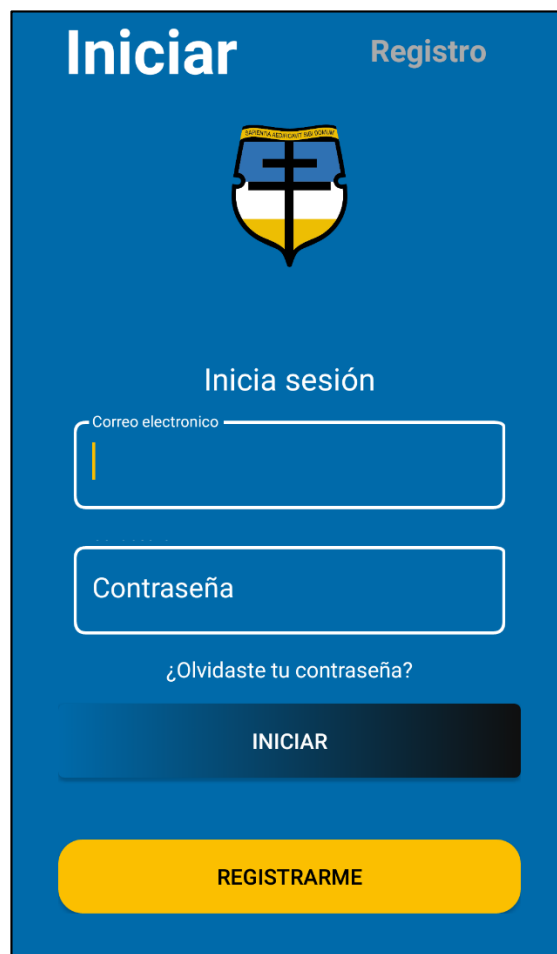
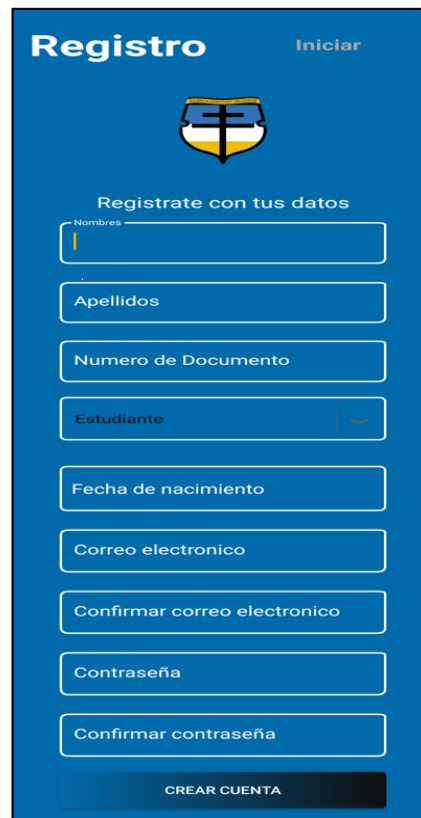
The image shows the home screen of the bitAD mobile application. The background is a solid blue color. At the top left, the word "Iniciar" is written in large white letters. At the top right, the word "Registro" is written in smaller white letters. In the center, there is a shield-shaped logo with a black cross on a white background, and a yellow banner at the top of the shield. Below the logo, the text "Inicia sesión" is centered in white. Underneath, there are two white input fields: the first is labeled "Correo electrónico" and the second is labeled "Contraseña". Below the "Contraseña" field, the text "¿Olvidaste tu contraseña?" is centered in white. At the bottom, there are two buttons: a dark blue button labeled "INICIAR" and a yellow button labeled "REGISTRARME".

Figure B1. Application Home Screen

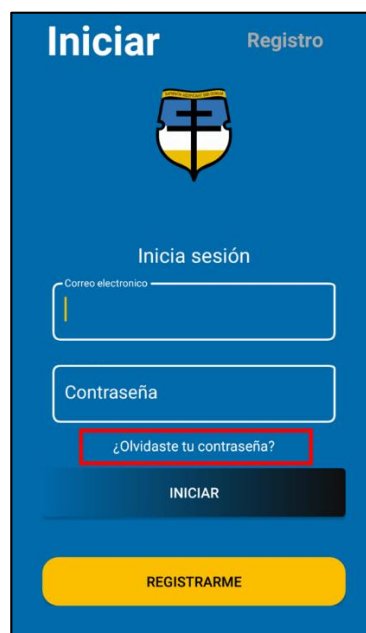
At the time of clicking on "Registrarme" a new window appears where you must fill in the necessary fields to create the respective account with which you can start using the application (See figure B2).



The registration screen features a blue background with a white shield logo at the top center. The title 'Registro' is in white, and 'Iniciar' is in a smaller white font to its right. Below the logo, the text 'Regístrate con tus datos' is centered. The form consists of ten white input fields with blue borders, stacked vertically: 'Nombres', 'Apellidos', 'Numero de Documento', 'Estudiante', 'Fecha de nacimiento', 'Correo electronico', 'Confirmar correo electronico', 'Contraseña', and 'Confirmar contraseña'. At the bottom is a black button with the text 'CREAR CUENTA' in white.

Figure B2. Application Registration Screen.

In which case the password has been forgotten, you can enter the option indicated in Figure B3



The login screen has a blue background with the same white shield logo. The title 'Iniciar' is in white, and 'Registro' is in a smaller white font to its right. Below the logo, the text 'Inicia sesión' is centered. The form includes two white input fields with blue borders: 'Correo electronico' and 'Contraseña'. Below these is a red rectangular button with the text '¿Olvidaste tu contraseña?' in white. At the bottom are two buttons: a black one with 'INICIAR' in white and a yellow one with 'REGISTRARME' in black.

Figure B3. Did you Forget your Password?

Pressing the button will display a box (See Figure B4) in which the email must be placed and an email will automatically arrive at the respective account entered at the time of registering the personal data (See Figure B5).

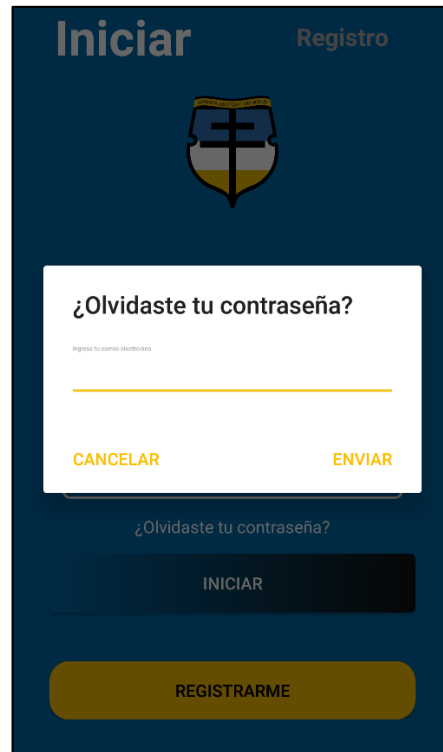


Figure B4. Information Box to Remember Password

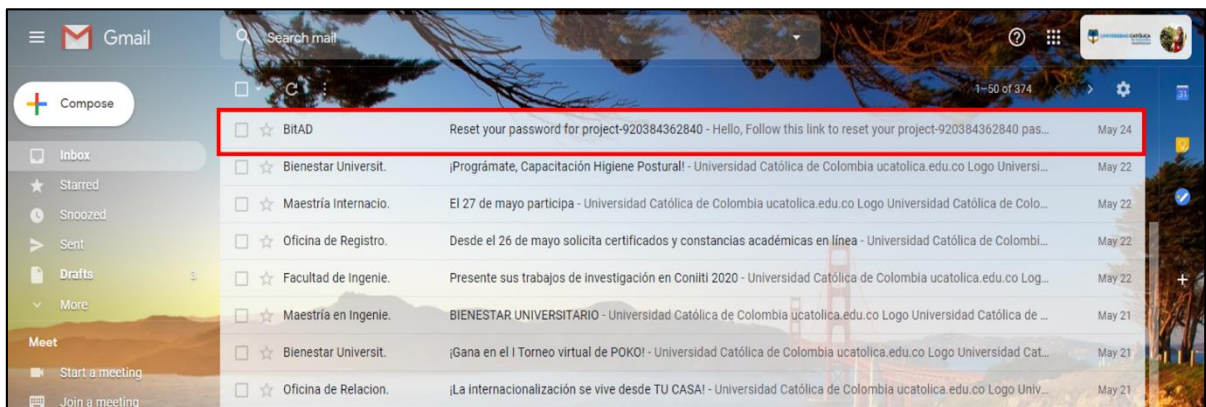


Figure B5. Mail with Password Change.

After entering the user data and clicking "Iniciar" the menu screen will be activated (See Figure B6) where the different options to be chosen by the user and the interface of the same are observed.

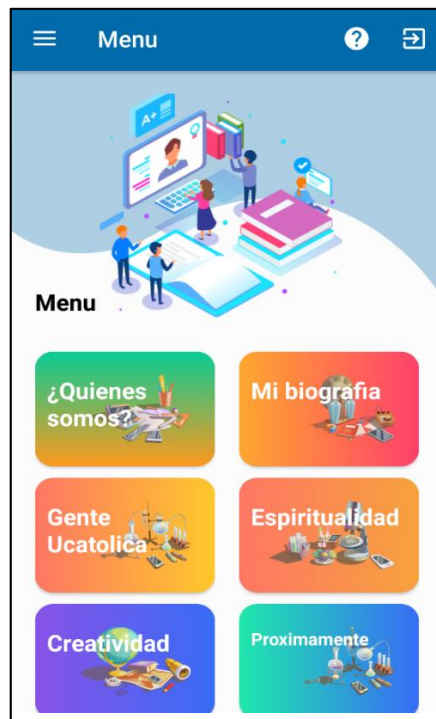


Figure B6. Application Menu.

Likewise, the shortcut menu is observed (See Figure B7) where you can more quickly enter the options and inquire about the personal profile, in addition to viewing the general information of the application and its menu.

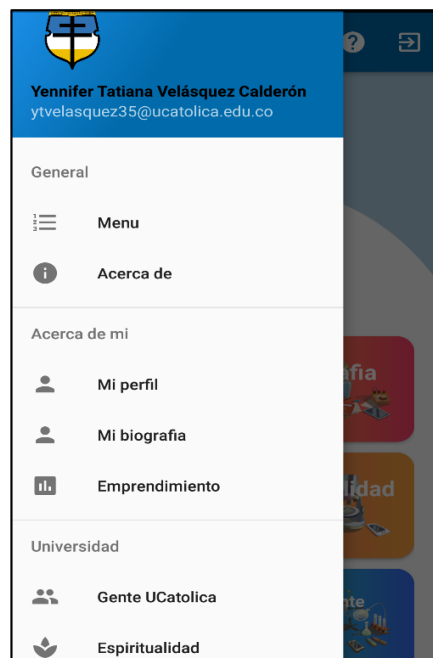


Figure B7. Shortcut Menu.

The first icon that is located on the screen is the About us? option (See Figure B8)



Figure B8. About Us? Icon

When we click on the icon of About us?, we see that it is not yet available for use, but it will be enabled soon in the next version (see Figure B9)



Figure B9. About Us? Options Display

The next icon that we find in the menu is My Biography (See Figure B10) which will open another series of options in which you can write personal data, ideas, thoughts and images for free and personal use.



Figure B10. My Biography Icon

My biography icon will open a new menu (See Figure B11) where you will find the options of how do I feel?, dreams, projects and goals, tools to get to know me, my glider and special moments.



Figure B11. My Biography Options Display

In the option How I feel? (See Figure B12) found in my biography you can write personal notes and edit them as you like,



Figure B12. How I Feel? Icon

In the indicated part of Figure B13 you have the option of creating a new note where you will have the opportunity to start writing and editing the personal notes (See Figure B14)

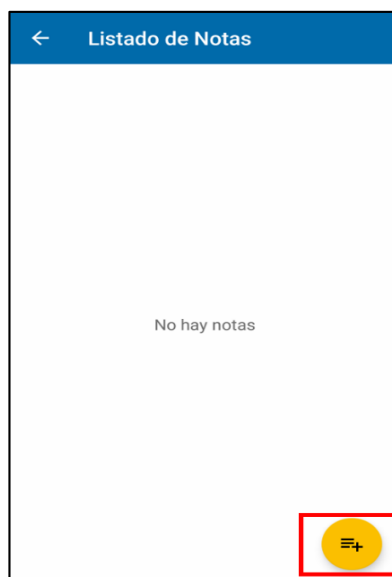


Figure B13. Add a New Note

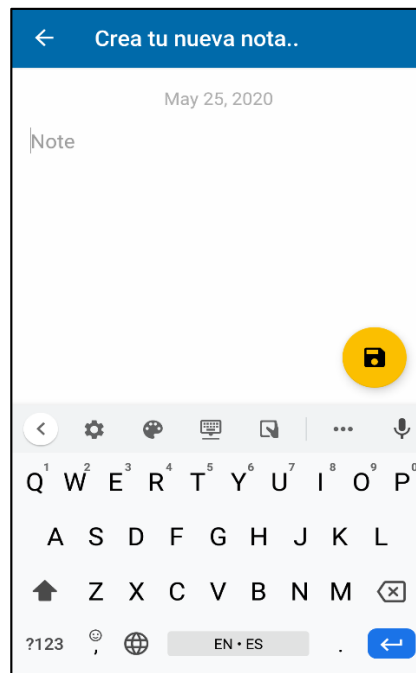


Figure B14. Create New Note

In the option of dreams, Projects and Goals (See Figure B15), you will have three alternatives to choose between dreams, projects and goals.



Figure B15. Dreams Project and Goals Icon

In this option you can freely write the ideas for each of the alternatives. (See Figure B16)

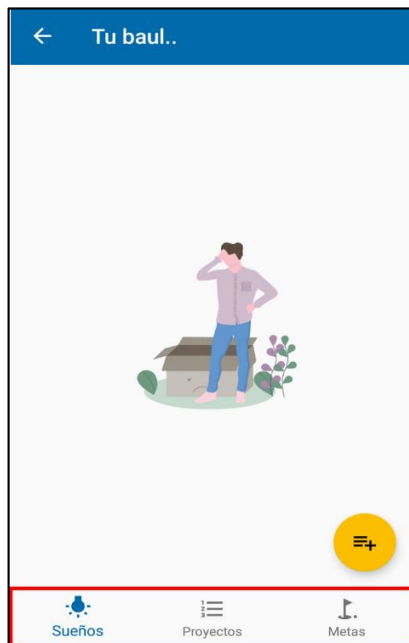


Figure B16. Dreams Project and Goals Option Display

In the Tools to get to know me option (See Figure B17) different tools can be described that serve for the personal and professional development of each user (See Figure B18).



Figure B17. Tools to Know me Icon

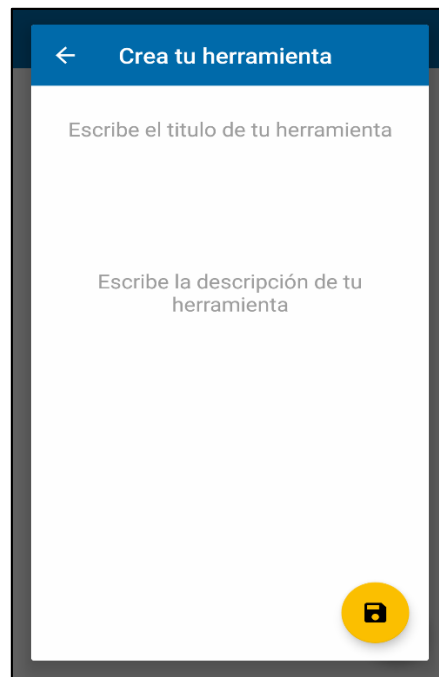


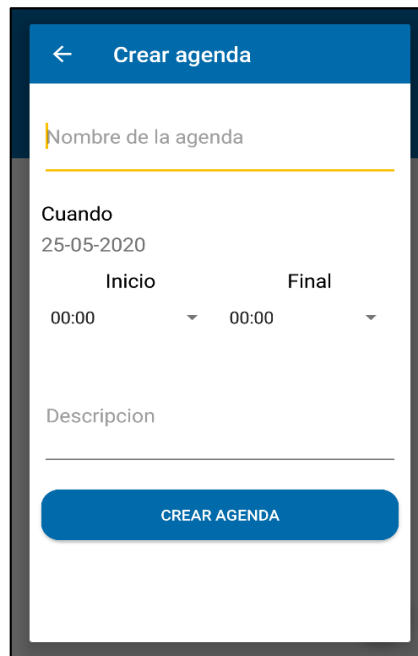
Figure B18. Add a New Tool

In the My Glider option (See Figure B19) you will have a personal diary available, which will help plan important dates and moments, with this you will have an order in the activities you carry out and will not forget vital dates.



Figure B19. My Glider Icon

In said glider it is observed that there is an option where an event can be established and created (See Figure B20)



The screenshot shows a mobile application interface for creating a new event. At the top, there is a blue header with a back arrow and the text 'Crear agenda'. Below the header, there is a text input field labeled 'Nombre de la agenda'. Underneath, there is a section titled 'Cuando' (When) with the date '25-05-2020'. Below the date, there are two dropdown menus for 'Inicio' (Start) and 'Final' (End), both set to '00:00'. Below these, there is a text input field labeled 'Descripcion'. At the bottom, there is a blue button labeled 'CREAR AGENDA'.

Figure B20. Create a New Event

Shows the name, time and state it is in if it is in process, pending, canceled or has ended (See Figure B21).



The screenshot shows a mobile application interface for viewing a user's agenda. At the top, there is a blue header with a back arrow and the text 'Mi agenda'. Below the header, there is a calendar view showing the dates from May 13 to May 17. The date May 15 is highlighted. Below the calendar, there are three event cards. The first card is titled 'Realizar presentación' (Perform presentation) and shows a clock icon, the time '00:00 - 01:30', and a yellow button labeled 'En proceso' (In process). The second card is titled 'Entrega Final' (Final delivery) and shows a clock icon, the time '06:00 - 08:00', and a red button labeled 'Cancelada' (Canceled). The third card is titled 'terminar parcial' (Partial termination) and shows a clock icon, the time '06:00 - 08:00', and a gray button labeled 'Pendiente' (Pending). At the bottom right, there is a yellow circular button with a plus sign and a clock icon.

Figure B21. Status of my Events

In the Special Moments option (See figure B22) you will have two alternatives "Gallery" and "Phrases"



Figure B22. Special Moments Icon

In the Gallery icon you can upload photos and/or images (See Figure B23) when you want to add a new image a box will open where these files can be uploaded (See Figure B24).

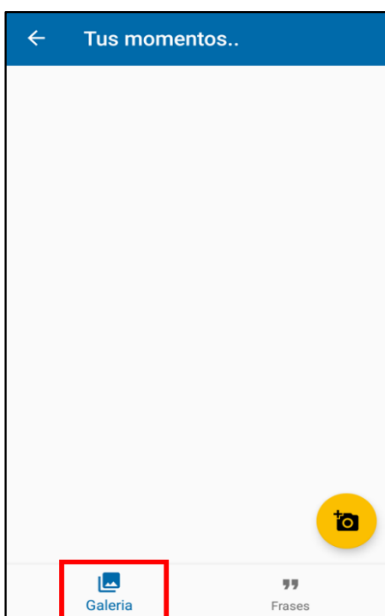


Figure B23. Gallery

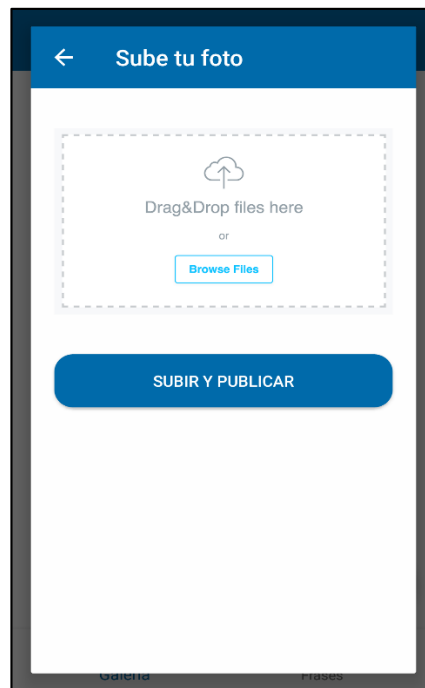


Figure B24. Add New Image

In the Phrases option (See Figure B25) you can write and publish the phrases that most attract attention, clicking on it enables the box where they can be written, by clicking on publish it will already be added to the list (See Figure B26)

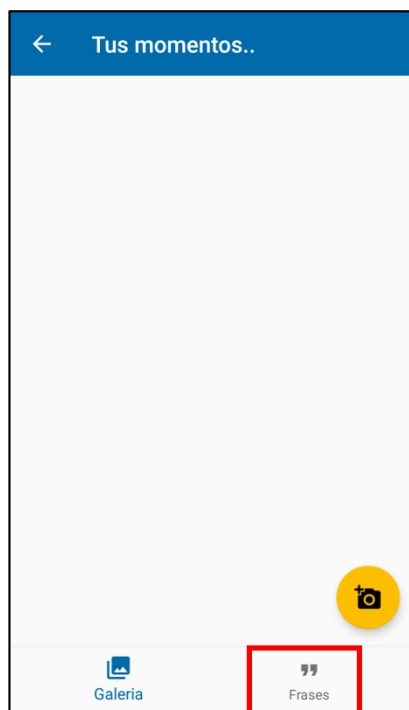


Figure B25. Phrases

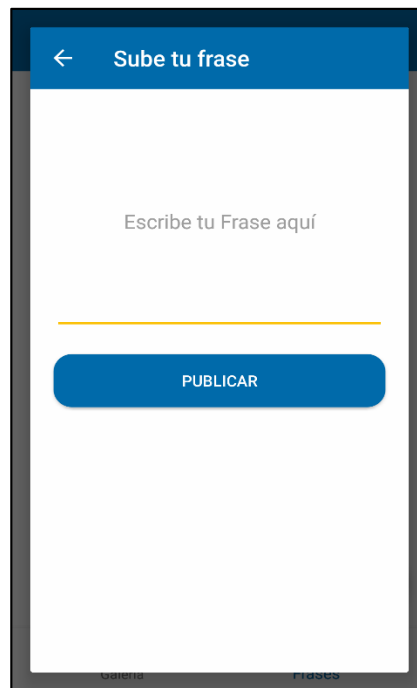


Figure B26. Add a New Phrase

In the menu the UCatólica People option (See Figure B27) will take you to different links on the university website, virtual psychologist, volunteering, internationalization and soon U Groups.

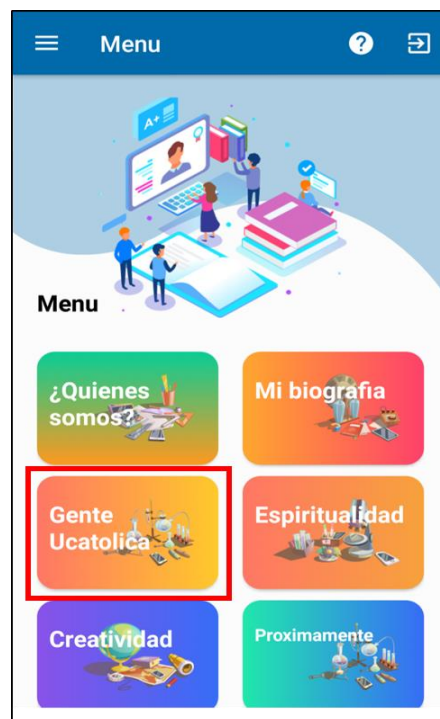


Figure B27. UCatólica People Icon

Within the menu of UCatolica people, we find the option of requesting an application for student counseling (See Figure B28) if you need to speak to someone the university psychologists will be willing to help.

Levanta la Mano

Usuario (Email sin dominio)

usuario

Contraseña (documento)

Contraseña

Tipo de usuario

Seleccione un tipo

INICIAR SESIÓN

[Olvide mi contraseña?](#)

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Psicología Virt

Figure B28. Virtual Psychologist

We also find the option of volunteering (See Figure B29) where you can visit the different activities offered by the area of human formation, pastoral and chaplaincy.

Formación Humana y Pastoral:

A continuación presentamos una referencia de los servicios y actividades que se realizan para fortalecer la formación integral y el espíritu católico de la comunidad universitaria. para conocer las programación clic [aquí](#).

--	¿A quién está dirigido?	¿Cómo participo?
Vida Universitaria con Sentido	Estudiantes, Profesores y Administrativos	Por inscripción - Vocación
Taller Estar Bien en la U	Estudiantes	Bienestar visita tu salón de clases
Franja de bienestar en Formación Humana	Estudiantes	Bienestar visita tu salón de clases
Encuentro de	Estudiantes	Por

Voluntariado

Figure B29. Volunteering

In the internationalization option (See Figure B30) you can obtain all the information about the student exchange opportunities offered by the university and the different agreements it has.



Figure B30. Internationalization

Additionally, there is the option of groups U (See Figure B31) that will be available for the next version of the App.



Figure B31. Groups U

The Spirituality icon (See Figure B32) where you will have the option of approaching inner peace through different tools.

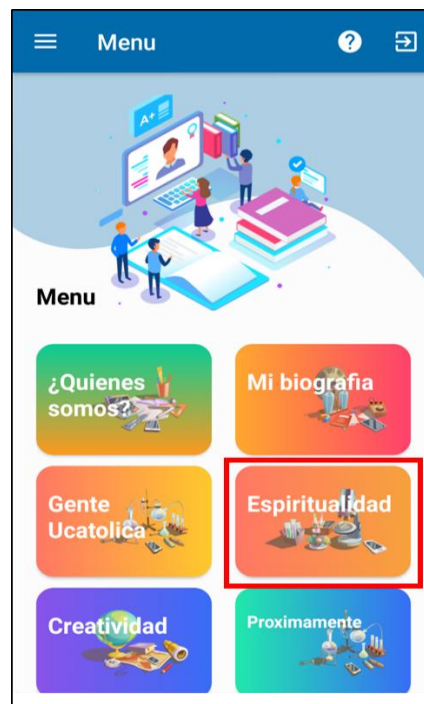


Figure B32. Spirituality Icon

Will be available in the next version of the application (See Figure B33).



Figure B33. Spirituality Options Display

In the Creativity icon (See Figure B34) you can edit and save entrepreneurial and creative ideas to carry out in the future.

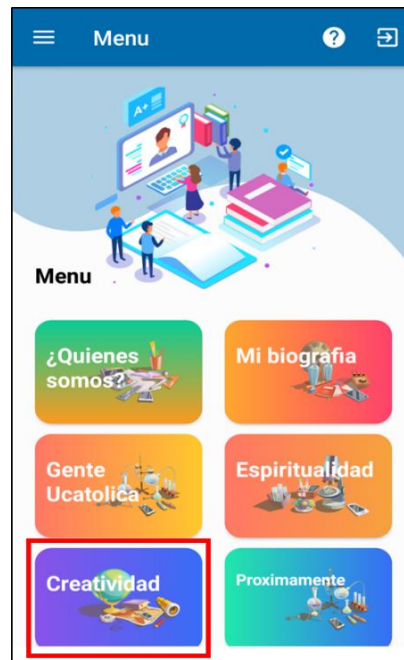


Figure B34. Creativity Icon

There are various options such as business projects, university employment exchange and access to the university wellness area (See Figure B35).



Figure B35. Creativity Options Display

In the Entrepreneurial Ideas Binnacle option (See Figure B36) you have the opportunity to create and save entrepreneurship ideas by creating a binnacle of the generated ideas (See Figure B37).



Figure B36. Entrepreneurial Ideas Binnacle

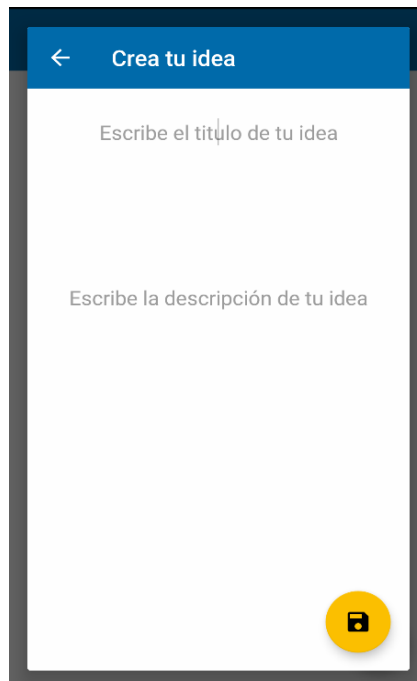


Figure B37. Create a New Idea

In the Welfare University option (See Figure B38), you can enter a direct link to the page of the "Universidad Católica de Colombia"



Figure B38. Welfare University

You can find the different activities that offer welfare for students (See Figure B39).



Figure B39. Welfare University Information

In the item of the UCatolica Employment Exchange (See Figure B40) you can review the employment options.



Figure B40. UCatolica Employment Exchange

Can be apply to the different offers of interest offered by the different companies in the country (See Figure B41).



Figure B41. UCatolica Employment Exchange Information